P5344

THREATENED AND ENDANGERED SPECIES BIOLOGICAL ASSESSM
FOR NORTHERN TIER PIPELINE,
WASHINGTON TO MINNESOTA

Final Draft

ENTAL RESEARCH & TECHNOLOGY, INC.
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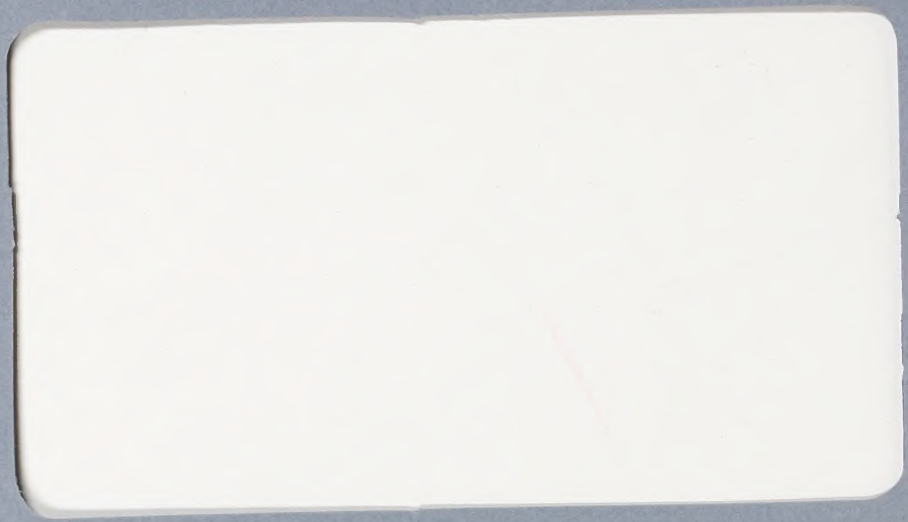

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THREATENED AND ENDANGERED SPECIES BIOLOGICAL ASSESSMENT FOR NORTHERN TIER PIPELINE, WASHINGTON TO MINNESOTA

Final Draft

Prepared for

U.S. BUREAU OF LAND MANAGEMENT
Billings, Montana

Submitted by

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.
Fort Collins, Colorado

Major Contributors

Judy S. Armbruster
Germaine Reyes-French
Lanny W. Reed

July 1980

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1.0 INTRODUCTION

In accordance with the Endangered Species Act of 1973, as amended in 1978, Environmental Research & Technology, Inc. has prepared this biological assessment of the Northern Tier Pipeline System proposal which is described in the U.S. Bureau of Land Management's Final Environmental Statement: Crude Oil Transportation Systems, released in November 1979. Several environmental documents have been generated related to the Northern Tier Pipeline proposal. These include the state of Washington Application for Site Certification (August 1979), the Montana Department of Natural Resources Final Environmental Statement (April 1980), North Dakota's Application for Certificate of Corridor Compatibility (December 1978), and Minnesota's Application for Certificate of Need to Construct a 40-inch Pipeline (August 1978). Revegetation manuals have been prepared for Washington, Montana, and North Dakota. A detailed Oil Spill Contingency Response Plan has been prepared for the marine portions of the project in the Strait of Juan de Fuca and Puget Sound and for the pipeline from Green Point to Arlington, Washington. A generic contingency plan has been prepared for all other terrestrial sections of the pipeline.

This biological assessment covers the entire 1,491 mile route from Port Angeles, Washington to Clearbrook, Minnesota. The biological assessment was based on route alignment data available on or before July 20, 1980. The species assessed were based on lists provided to the U.S. Bureau of Land Management in July 1978, October 1978, July 1979, and October 1979 by U.S. Fish and Wildlife Service, the final species list was determined at a meeting held at Billings, Montana in February 1980. Figures 1-1 through 1-5 illustrate the proposed Northern Tier Pipeline System route and the occurrence of those threatened and endangered species that could potentially be affected by construction or operation of the pipeline.

Although there currently are no threatened and/or endangered plant species occurring on the route, several species which were previously "proposed" or are "candidate" species for proposal do occur along the route. The status of these plants is pending and varies with each species. Therefore, the species discussed in this assessment may or may

not be considered threatened or endangered in the future. It will be necessary to review and assess endangered plants potentially affected by the Northern Tier Pipeline System (NTPS) when the new "candidate" list of species is published in the Federal Register. This list should be released in August 1980.

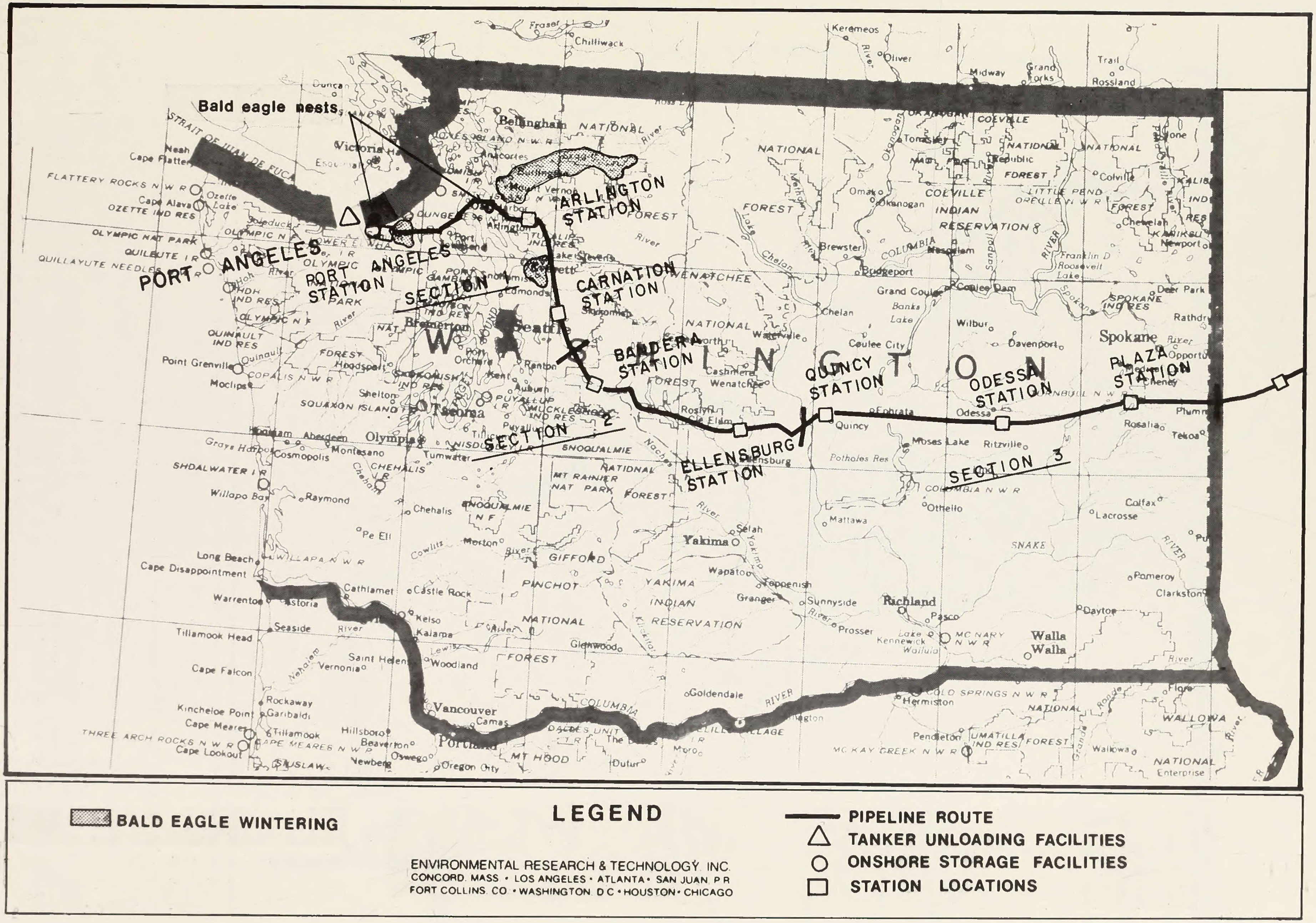

Figure 1-1. Threatened and Endangered Species Occurring Near the Northern Tier Pipeline System in Washington (June 1980).

gure 1-2. Threatened and Endangered Species Occurring Near the Northern Tier Pipeline System in Idaho and Western Montana (June 1980).

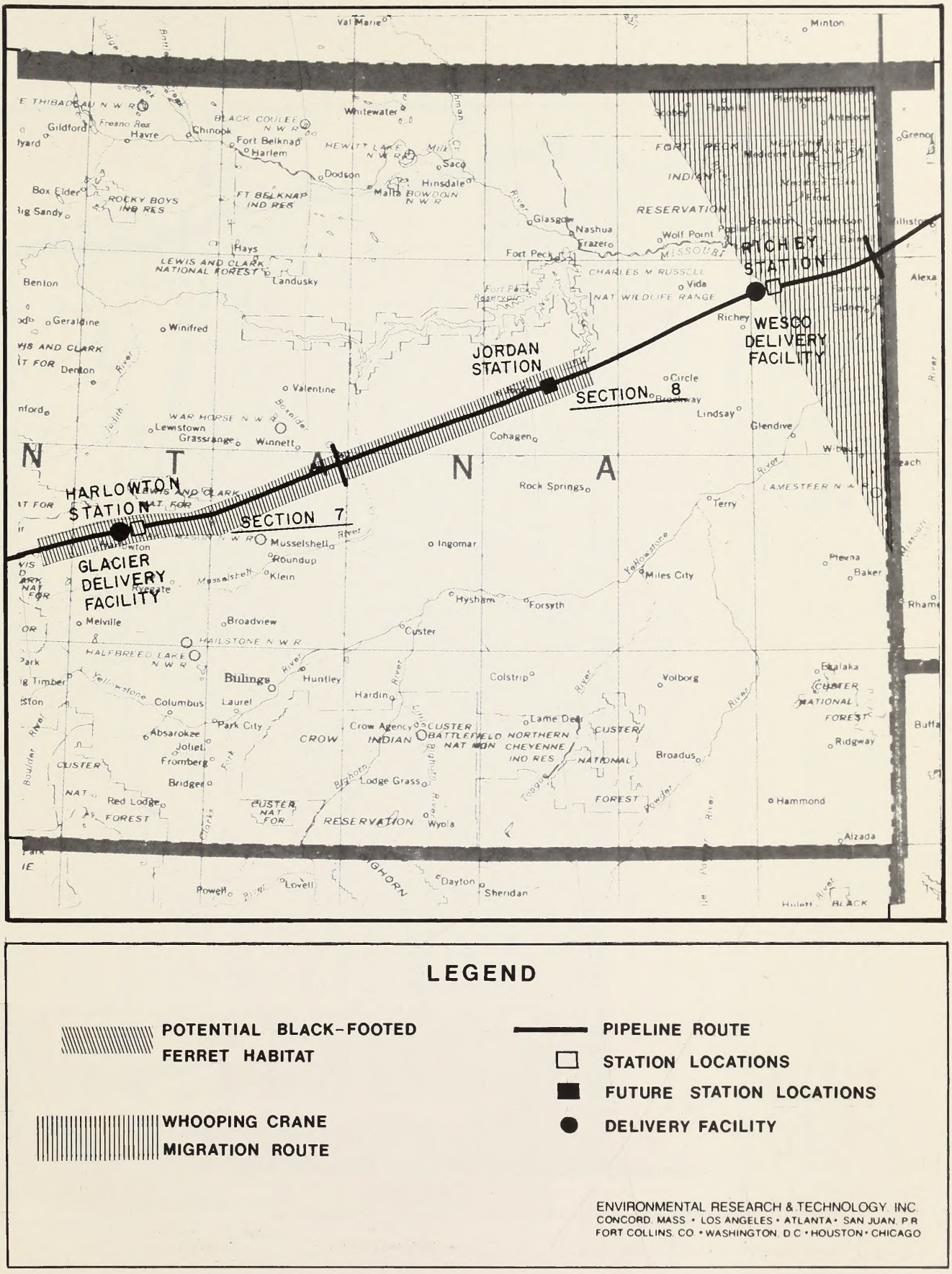

Figure 1-3. Threatened and Endangered Species Occurring Near the Northern Tier Pipeline System in Eastern Montana (June 1980).

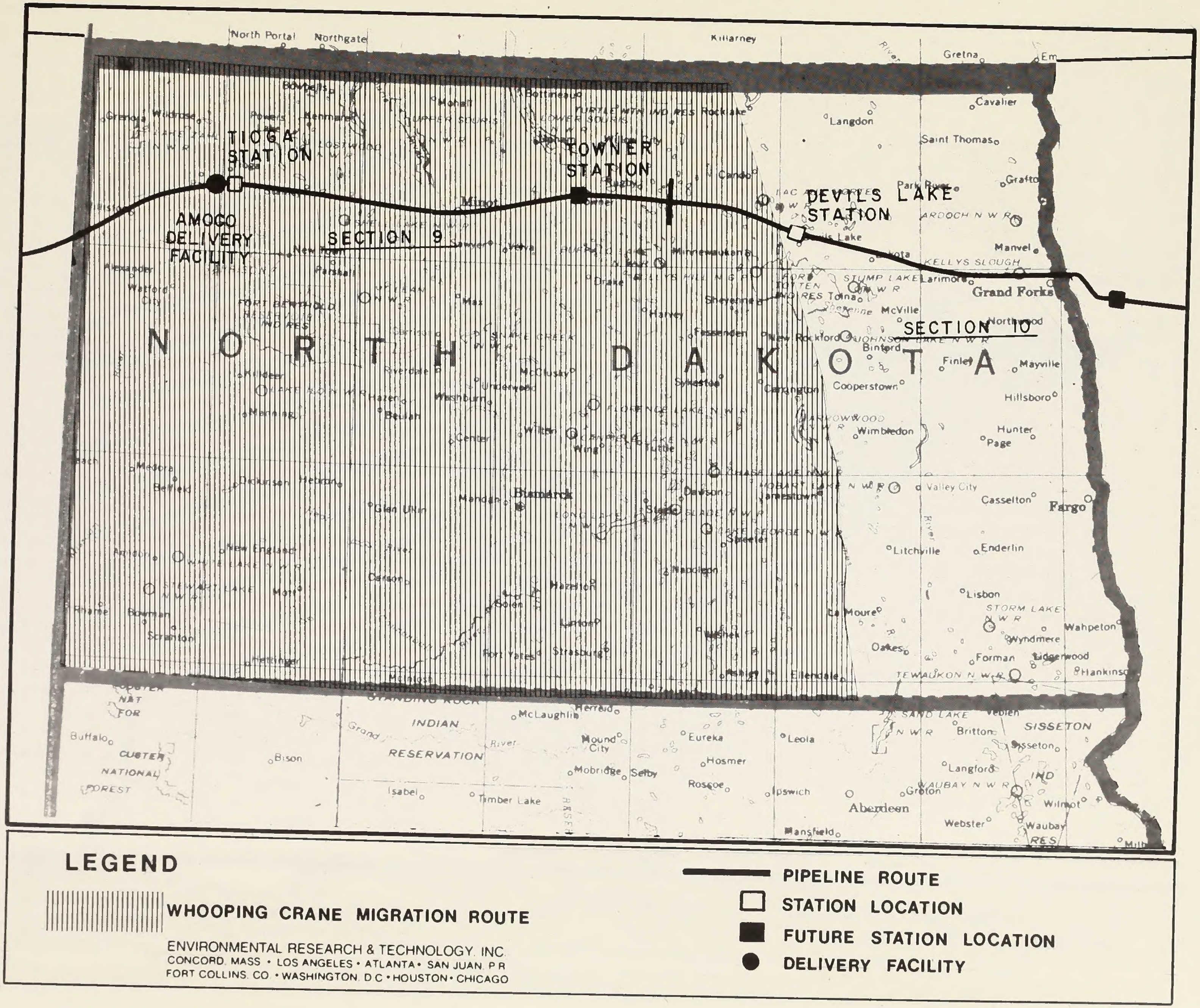

Figure 1-4. Threatened and Endangered Species Occurring Near the Northern Tier Pipeline System in North Dakota (June 1980).

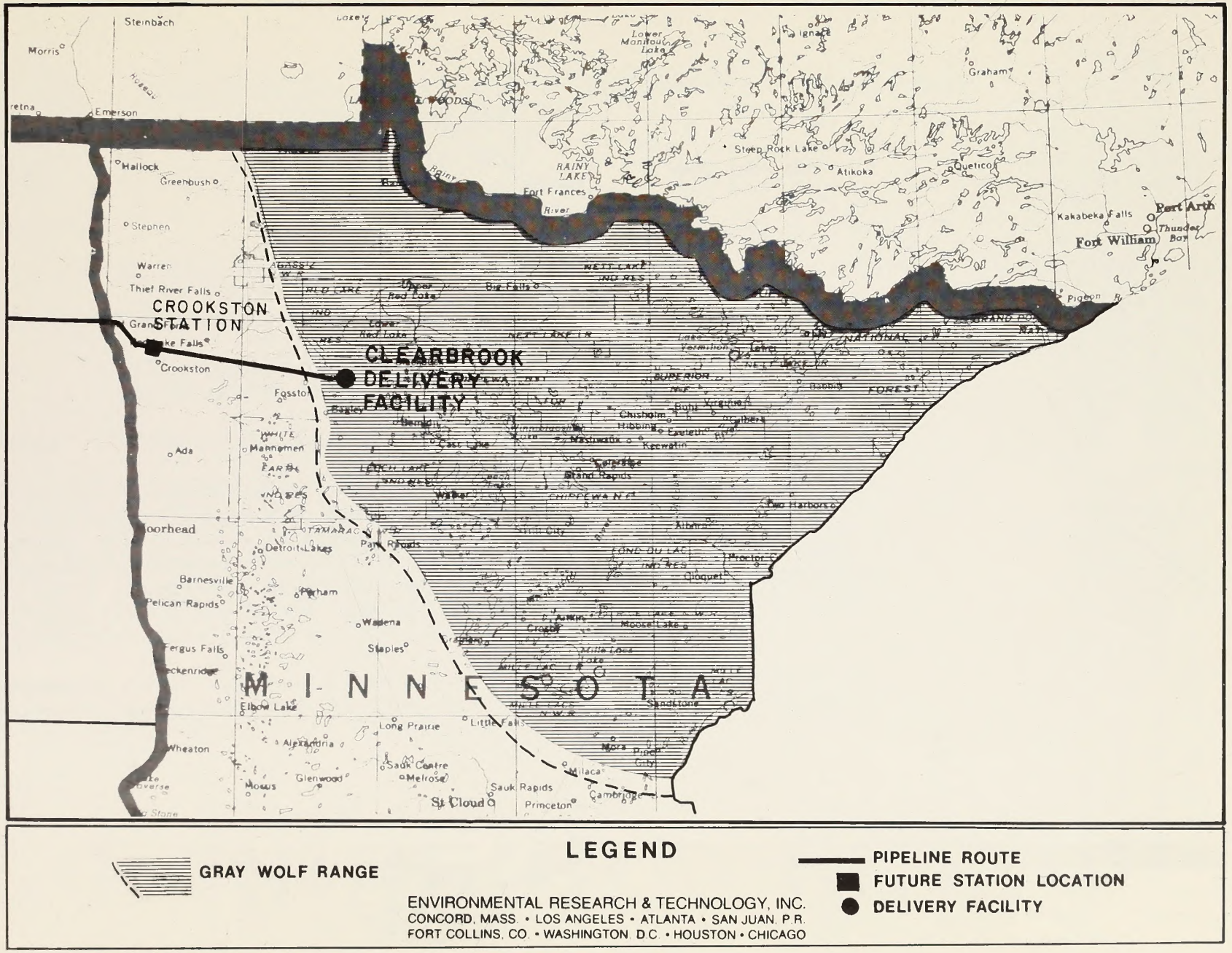

Figure 1-5. Threatened and Endangered Species Occurring Near the Northern Tier Pipeline System in Minnesota (June 1980).

2.0 PROJECT DESCRIPTION

The Northern Tier Pipeline Company (NTPC) proposes to build a common-carrier crude oil pipeline across Washington, Idaho, Montana, North Dakota, and Minnesota for the purpose of moving Alaskan North Slope and foreign crude oil to inland states to make up for anticipated shortages. The proposed Northern Tier Pipeline System would include unloading facilities for receiving oil by tanker at Port Angeles, Washington; two submarine pipelines to connect the unloading berths to an onshore storage facility northeast of Port Angeles at Green Point, Washington; and a 2,399-km (1,491-mi) underground pipeline terminating at Clearbrook, Minnesota. The following description of the system facilities was taken from the Washington Application for Site Certification (NTPC 1979) and the Final Environmental Statement (U.S. Bureau of Land Management 1979).

2.1 Marine Terminal

2.1.1 Tanker Unloading Facilities

The tanker unloading facilities would be constructed within the natural, deepwater harbor at Port Angeles. Fixed tanker berths will be provided in 100 feet of water, with connecting trestles to the south shore of Ediz Hook. The facilities will be capable of simultaneously unloading two crude oil tankers, ranging in size from the 18,000 dead weight tons (DWT) class to the 300,000 DWT class. Two tanker unloading berths will be constructed for the initial design capacity, with provision for a third berth if dictated by system demand. Transfer of the oil to the onshore storage facilities, approximately 6.5 miles to the east, will be by two unloading submarine pipelines extending to the east end of Ediz Hook and crossing Port Angeles Harbor. Figure 2.1-1 provides an artist's concept of the marine terminal facilities. A current construction schedule for all facilities is not available at this time.

The tanker berths will be located to provide a water depth of 100 feet at mean lower low water (mllw) and will be designed to unload crude oil at rates up to 100,000 barrels per hour (bph). Due to the elevation of the onshore storage facility (120-190 feet), booster pumps will be provided to assist the ship's cargo unloading pumps. Two

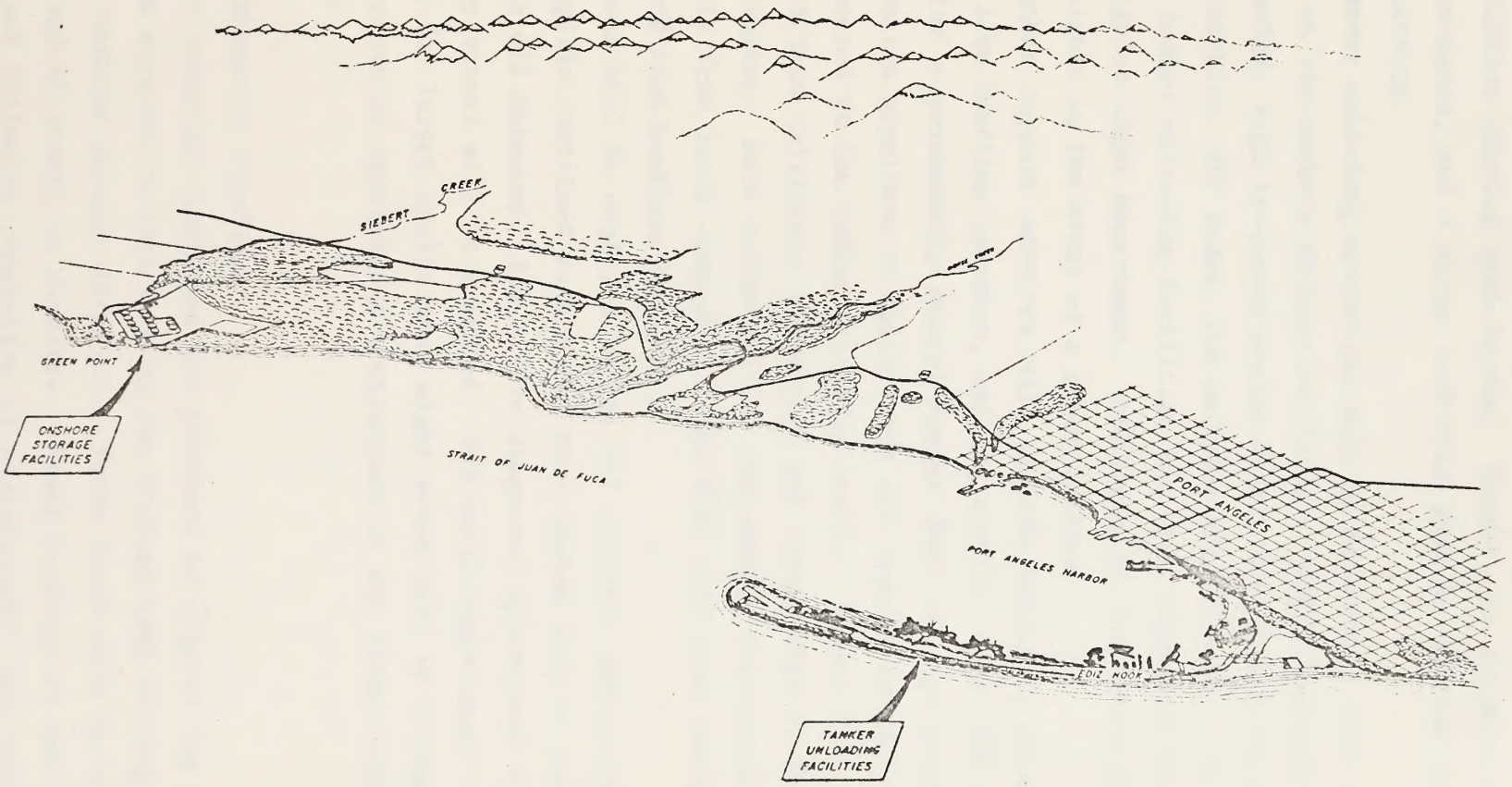

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Figure 2.1-1 Marine Terminal
Artist's Concept

8,000 horsepower (HP) to 10,000 HP electric motor driven pump units, one for each unloading pipeline, will be installed on a separate booster pump platform serving both berths. Meters, to document the amount of cargo unloaded, and a surge tank will also be located on the booster pump platform.

Tanker unloading operations will be controlled from the main control center at the onshore storage facilities. Communications systems to be used include high frequency marine radio, direct and conventional telephone circuits, UHF radio, and portable/mobile units. Electrical power to the tanker unloading facilities has been requested from the City of Port Angeles Light Department. Additionally, emergency generators will be available in the event of a power failure.

Tanker support services will include bunkering service, potable water, line handling launches, and tug service. The NTPC will install a berth for a permanently moored bunker fuel storage barge and fuel distribution pipelines to allow crude oil tankers to receive bunker fuel while moored at the tanker unloading berths. Bunker fuel will be primarily supplied from California refineries and transported to Port Angeles in small tankers. Each tanker will be responsible for ordering tug service, available from local companies. The NTPC will make available potable water and line handling launches.

Booms will be deployed before oil transfer operations. Oil from small spills contained within the boom system will be recovered using floating oil skimmers. For a more dispersed operational spill, a skimmer-recovery vessel will be provided. Oil spill containment, recovery, and cleanup for larger spills that might occur will be accomplished using the services of specialized contractors or the Clean Sound Cooperative (CSC).

2.1.2 Submarine Pipelines

Two submarine pipelines are proposed to connect the booster pump platform adjacent to Ediz Hook to the storage tank filling line manifold at the onshore storage facility. These lines will be 5.2 miles in length and 48 inches in diameter. Final location of the lines will be determined following completion of oceanographic and bottom sediment studies.

The capacity of the submarine pipelines will allow a reduction in tanker turnaround times and accommodate wide variations in tanker arrival frequency. Consequently, submarine pipelines will be inactive approximately 74 percent of the time for the initial design capacity of 709,000 barrels per day and 66 percent of the time for the ultimate design capacity of 933,000 barrels per day.

The submarine pipelines will be constructed of thick-walled pipe protected by approximately 2 to 4 inches of reinforced concrete coating, and will be buried beneath the harbor bottom to lessen the possibility of damage by ship's anchor.

The leak detection system will be different for inactive and active line conditions. For the inactive condition, static line pressure will be monitored at the booster pump platform. Preliminary studies by NTPC indicate that leaks as small as 50 to 100 barrels (0.07 to 0.14 percent respectively) of the contents of one line could be detected. For the active or operating condition, a sonic flow metering type of monitoring and leak detection system will be used. This system will have a comparative measurement accuracy of 0.5 percent of the pipeline capacity. A second, though less accurate, leak detection system for the active condition will consist of continuous simultaneous monitoring by computer flow of the meters on the booster pump platform and gauges on the Green Point storage tanks.

With either active condition detection system, deviation greater than the pre-determined normal range will activate alarm and data printout circuits at the terminal control center. The dispatcher will shut down the operation, allow the system to become static, and monitor static pressures. If static pressure monitoring confirmed a leak, the oil in the line will be displaced with water. The line will be taken out of service while repairs were made.

The pipeline route will be patrolled twice daily by a small launch. Relatively small amounts of oil would produce a sheen on the water surface that could be detected visually. The launch will be equipped with an infrared scanning device designed to detect oil not discernible by the human eye.

2.2 Onshore Storage Facility

The onshore storage facility will be constructed using approximately 140 acres of a 242-acre site approximately 6 miles east of Port Angeles at Green Point. The facility will include storage tanks, piping systems, runoff holding basins and drainage facilities, oil-water separators, oil measurement facilities, control building, and support facilities. The initial pipeline pump station, main control center, maintenance facilities, and warehouse will also be located on the onshore storage site. The layout of the proposed onshore storage facility is shown in Figure 2.2-1.

Initially, eleven 545,000-barrel tanks will provide 6 million barrels of storage. As throughput increases, an additional seven tanks containing 3.8 million barrels of storage will be constructed to provide storage for the projected maximum throughput of 933,000 barrels per day. If required by further growth or for operational flexibility, space would be available for construction of additional storage up to a total of 13.6 million barrels.

The proposed storage tanks will be 285 feet in diameter with a shell height of 56 feet. They will be equipped with floating roofs that will have primary and secondary sealing devices at their perimeters to minimize hydrocarbon vapor emissions.

The runoff holding basins will serve two functions. If a tank, valve, or pipeline within a diked area should develop a leak, the escaped oil would be retained in the large basin and later transferred to an empty tank. The basins also would retain surface storm water runoff from within the diked areas. Then, this runoff would be processed by oil-water separators prior to discharge.

Facilities for control of roof drainage, storm water runoff, and oil spillage will consist of low dikes surrounding groups of tanks and remote holding or impounding basins. Each large basin will have a capacity equal to the capacity of one tank plus a storm water allowance. The area occupied by the initial group of 11 tanks, will be enclosed on three sides by a common dike approximately 6 feet in height. Permeability of onsite soils used in dike construction will be determined following completion of geotechnical studies. If onsite soils were found to be unsuitable, select offsite material will be hauled in and used for

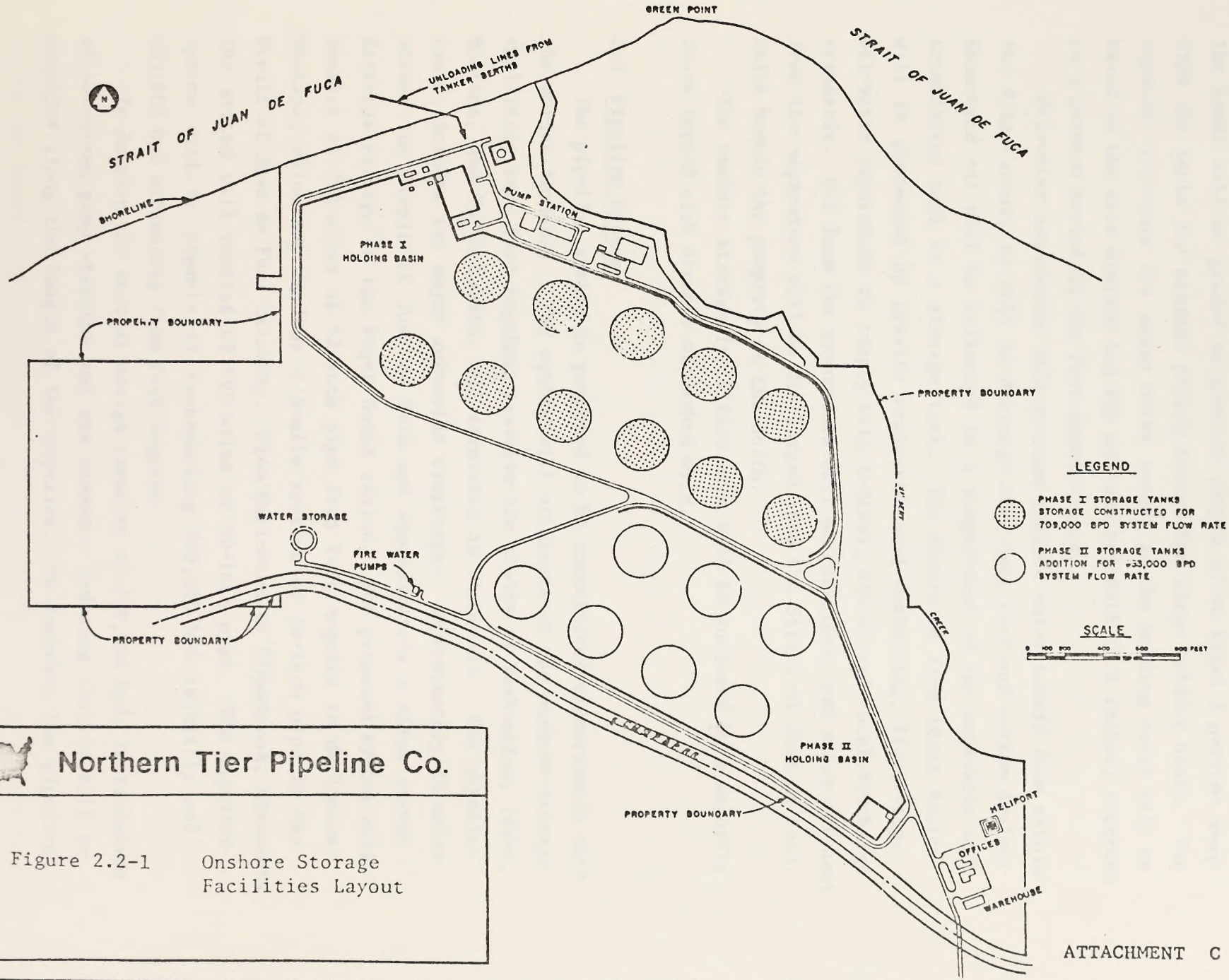

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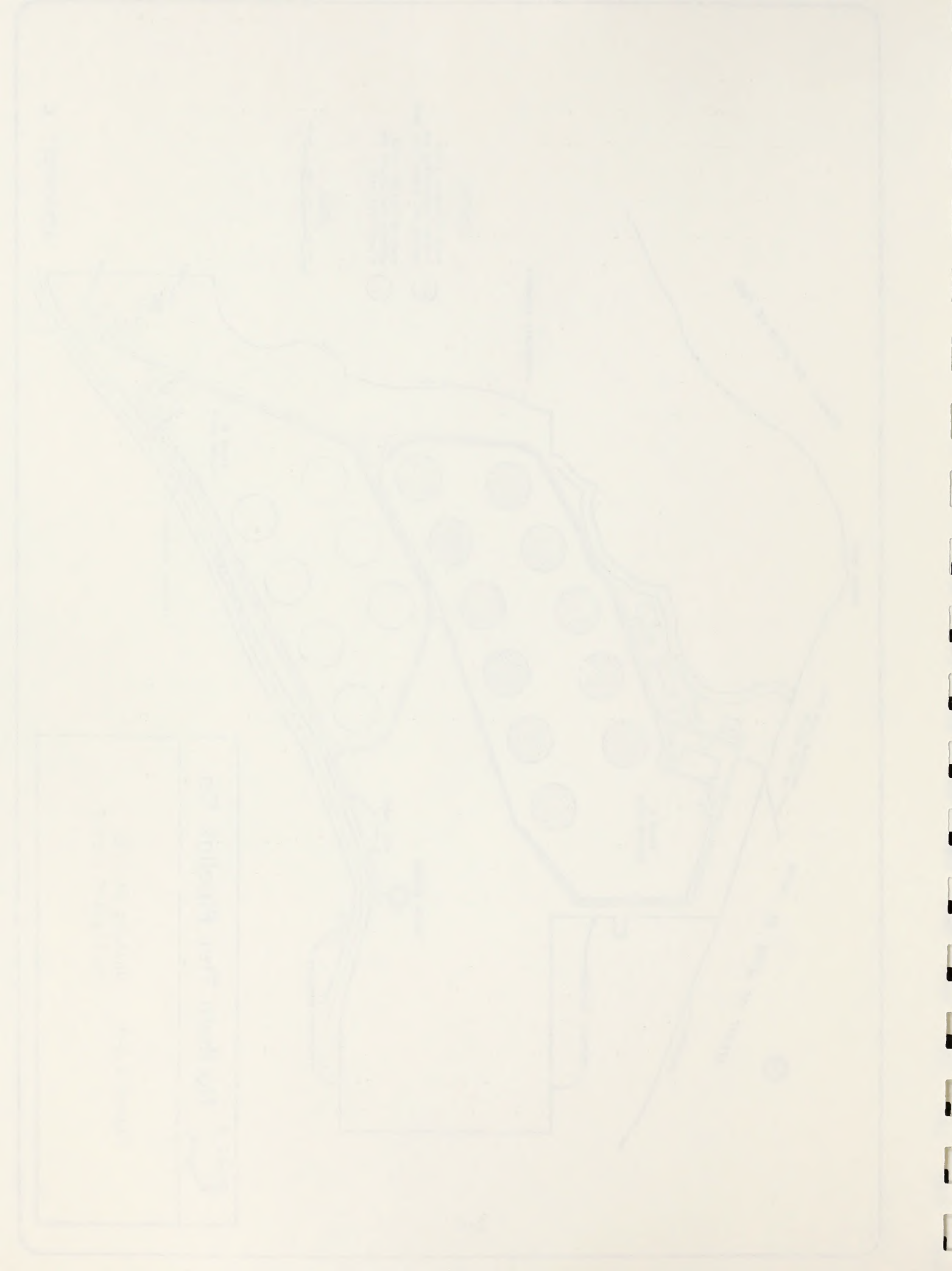
Figure 2.2-1 Onshore Storage Facilities Layout

ATTACHMENT C



construction of an impermeable core in all dikes. The area occupied by the tanks will be graded to provide slopes of at least 1 percent away from the tanks and exposed piping toward the large holding basin. The capacity allowance for storm water runoff in the holding basin will be based on the area drained and the maximum rainfall (3.3 inches) recorded in a 24-hour period in the Port Angeles area.

Oil-water separators will process surface water runoff from within the diked areas, as well as drainage from tank roof and bottom drains. Recovered oil will be collected in a compartment of the separator and transferred back to a storage tank. The discharge from these basins will be processed by gravity separation and coalescing, filter-type oil-water separators to comply with federal, state, and local discharge standards. Oil from the separators will be reclaimed, and water effluent from the separators will be discharged into the Strait of Juan de Fuca, which bounds the property on the north.

The onshore storage facilities area will be enclosed by a security fence topped with strands of barbed wire.

2.3 Pipeline System

The pipeline system is proposed to be constructed concurrently with the marine terminal. The system will originate at the onshore storage facilities near Port Angeles; traverse the states of Washington, Idaho, Montana, and North Dakota; and terminate in Minnesota. The pipeline route includes two major submarine crossings; approximately 18 miles across the Strait of Juan de Fuca and approximately 4 miles across Saratoga Passage in the Puget Sound region. The proposed system will consist of 798 miles of 42-inch pipe from Port Angeles to Harlowton, Montana, which may include a 6-mile section of 36-inch pipe in the Strait of Juan de Fuca crossing. From Harlowton to Clearbrook, Minnesota, the system will consist of 693 miles of 40-inch pipe. The pipeline system will be capable of transporting 709,000 bpd initially and 933,000 bpd ultimately from Port Angeles.

To develop the initial design capacity of 709,000 bpd, installation of seventeen pump stations and one pressure reducing station will be required along the length of the pipeline. To increase the pipeline

capacity to the ultimate design capacity of 933,000 bpd, three additional pump stations and the installation of additional equipment at the initial pump station will be required. Pump stations will require about 6 to 7 acres of land.

A delivery facility is proposed to be constructed at Clearbrook, Minnesota. At Clearbrook, provisions will be made to deliver oil to the existing Lakehead and Minnesota Pipeline Systems. The NTPS will also be capable of delivering to other existing pipelines and refineries along the route. Delivery facilities will be located at these points as required.

The "utilities corridor" concept was used in the selection of the pipeline route by using or paralleling existing power lines and other pipelines, railroad, and highway rights-of-way whenever possible. Table 2.3-1 shows the miles of pipeline parallel to existing rights-of-way. Generally, the width of the permanent right-of-way will be 75 feet; however, additional width will be required temporarily during construction to provide adequate working space for equipment, a construction rights-of-way of 90 feet is planned. The permanent rights-of-way on federal lands will be 54 feet.

Terrestrial pipeline construction will generally proceed west to east simultaneously within each construction section. There will be ten sections for the entire system. The portion within the section under actual construction, called a construction spread, will range from 8 to 16 miles in length, depending on the terrain and working conditions. It is expected that 4 to 8 miles of the ditch will be open within a spread at any one time during construction. Figure 2.3-1 illustrates a typical construction spread. Except for special areas, the pipeline will be buried with a minimum of 36 inches of cover over the entire route.

During construction, NTPC will segregate and replace any topsoil removed. Figure 2.3-2 illustrates construction on the permanent 90-foot rights-of-way. Disturbed areas will be graded to blend with the existing contours. The right-of-way will be reseeded with native vegetation where possible, and aboveground facilities will be landscaped to reduce the visual impact of the system.

Soil excavated in the trenching operation will be returned to the trench as backfill (Figure 2.3-3). Excess soil will be crowned up over the trench so that normal settlement would not create a depression in

TABLE 2.3-1

NTPS USE OF UTILITY CORRIDORS
(miles)

State	Pipeline Route Adjacent to Existing Rights-of-Way			
	Powerline	Pipeline	Railroad	Total
Washington	102.0	24.4	14.5	140.9
Idaho	13.8	10.3	0	24.1
Montana	19.1	70.0	4.0	93.1
North Dakota	21.0	120.7	43.8	185.5
Minnesota	0	60.3	0	60.3
TOTAL	155.9	285.7	62.3	503.9

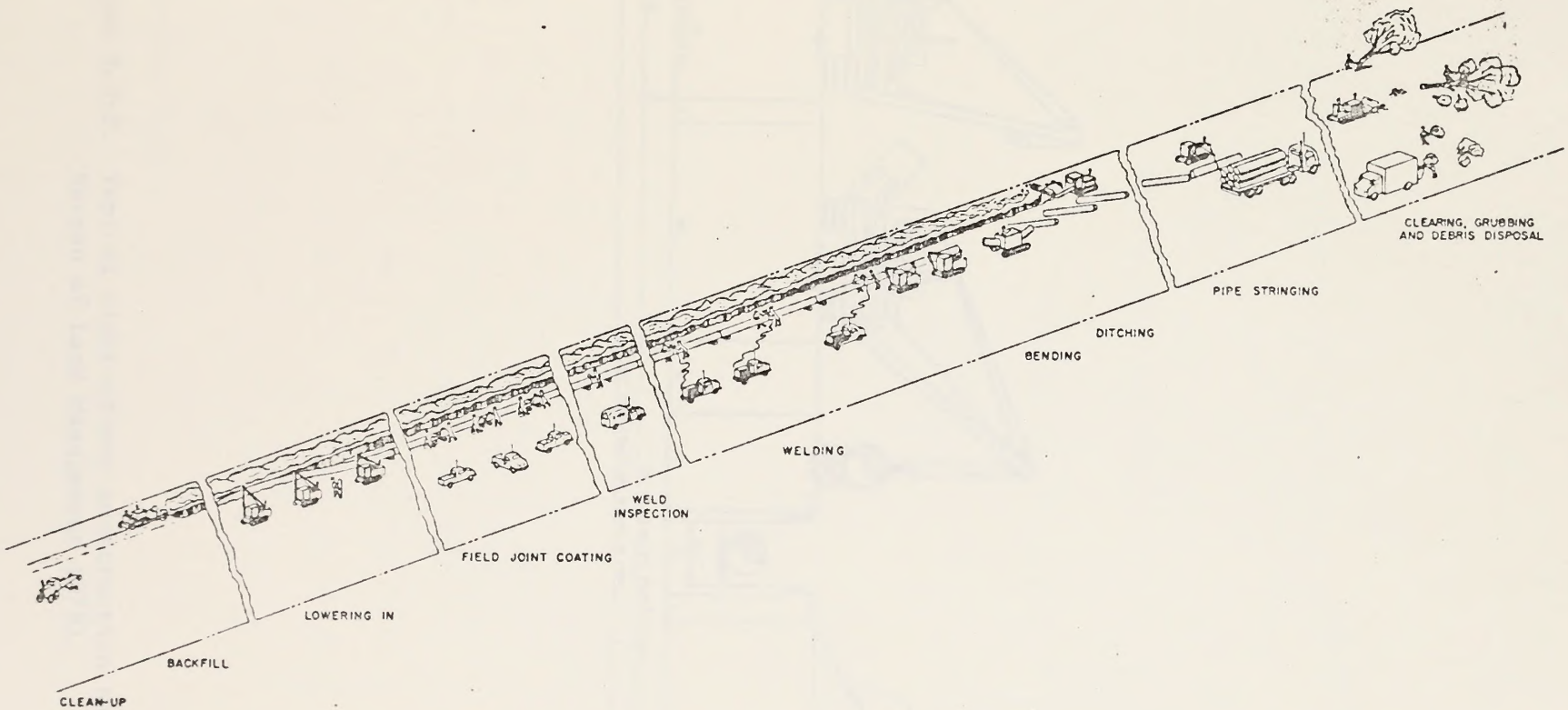


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Figure 2.3-1 Pipeline Typical Construction Spread Artist's Concept

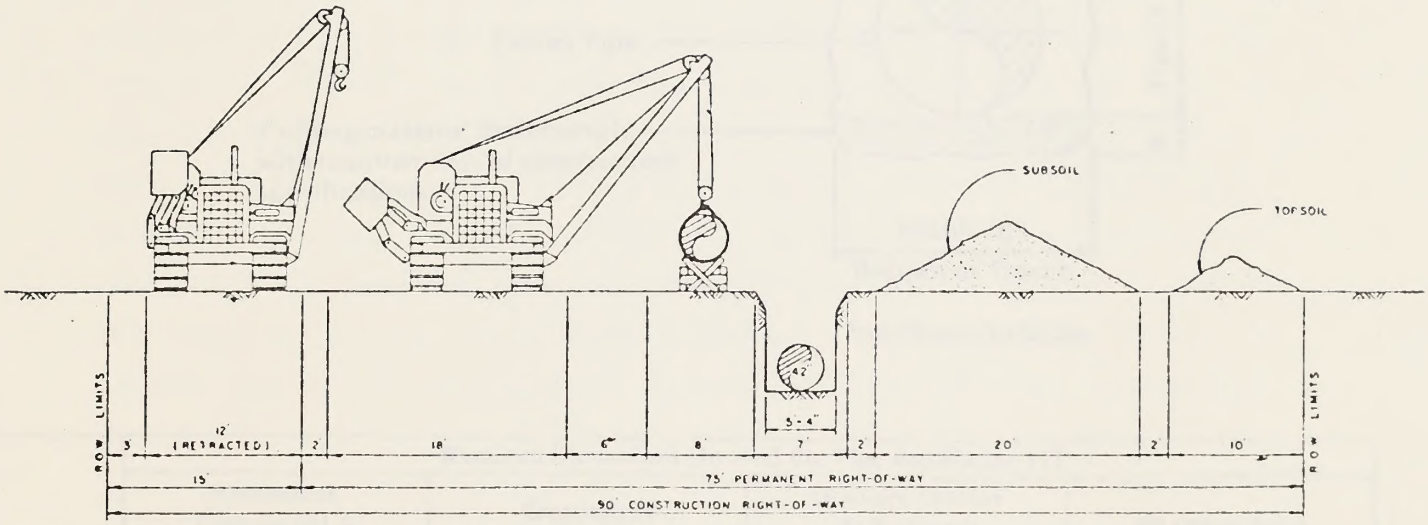
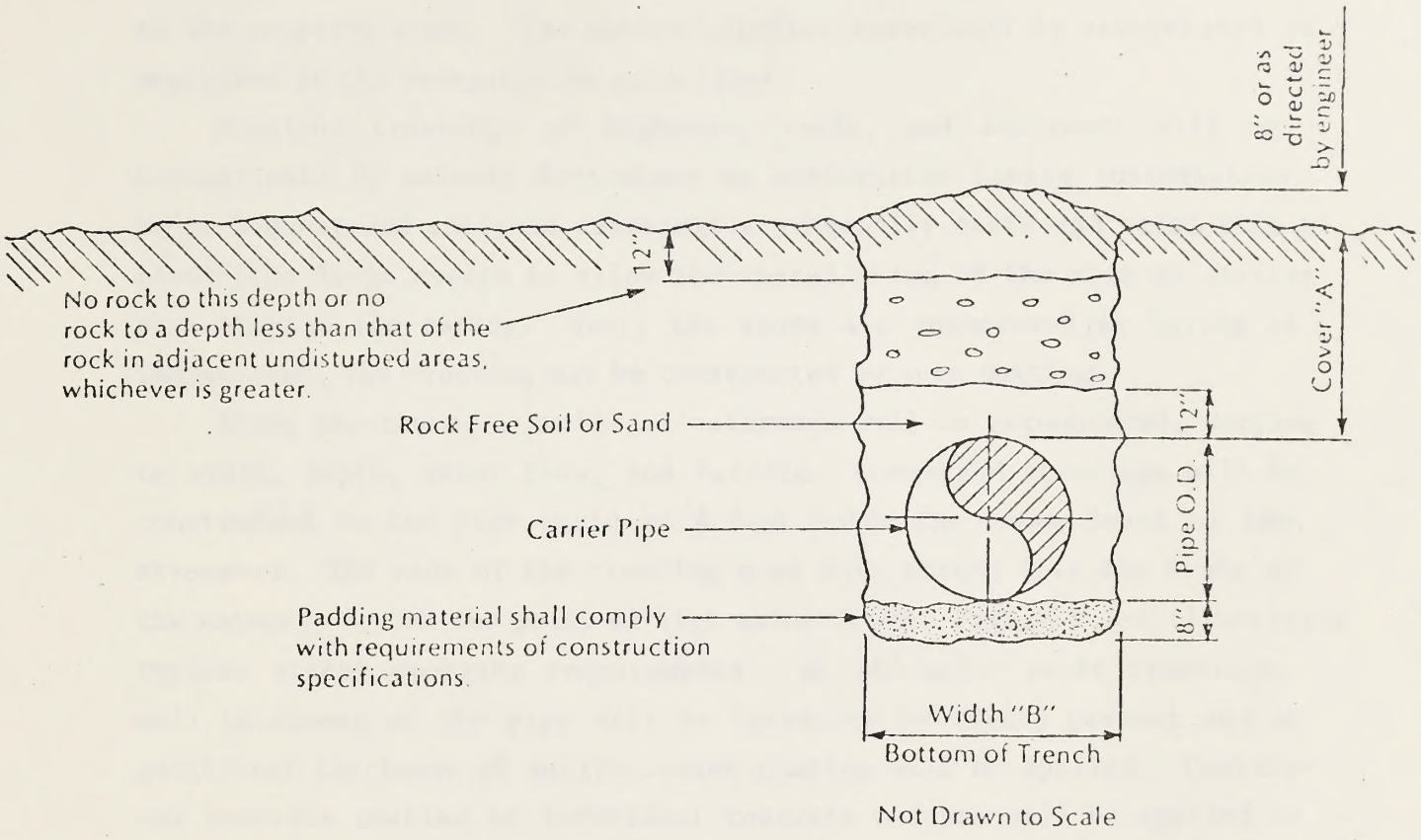


Figure 2.3-2. Typical right-of-way construction spread (Source: U.S. Bureau of Land Management 1979).



Nominal Pipe Size (Inches)	Required Dimensions (Inches) For Pipe Installation (1)											
	Residential, Commercial & Industrial Areas			Crossings of Water Courses			Drainage Ditches At Railroads & Public Roads			All Other Areas		
	Cover "A"		Width "B"	Cover "A"		Width "B"	Cover "A"		Width "B"	Cover "A" (2)		Width "B"
	Norm Excav	Rock		Norm Excav	Rock		Norm Excav	Rock		Norm Excav	Rock	
40	36	30	62	48	18	76	36	36	62	36	18	62
42	36	30	64	48	18	78	36	36	64	36	18	64

NOTES:

1. These are minimum specifications.

2. Cover may be greater in areas where deep cultivation occurs or is likely to occur. Additional cover may be required in rock areas. Refer to the alignment sheets and/or construction line list for such additional requirements.

Figure 2.3-3. Minimum pipeline trench and backfill requirements for the Northern Tier Pipeline (Source: U.S. Bureau of Land Management 1979).

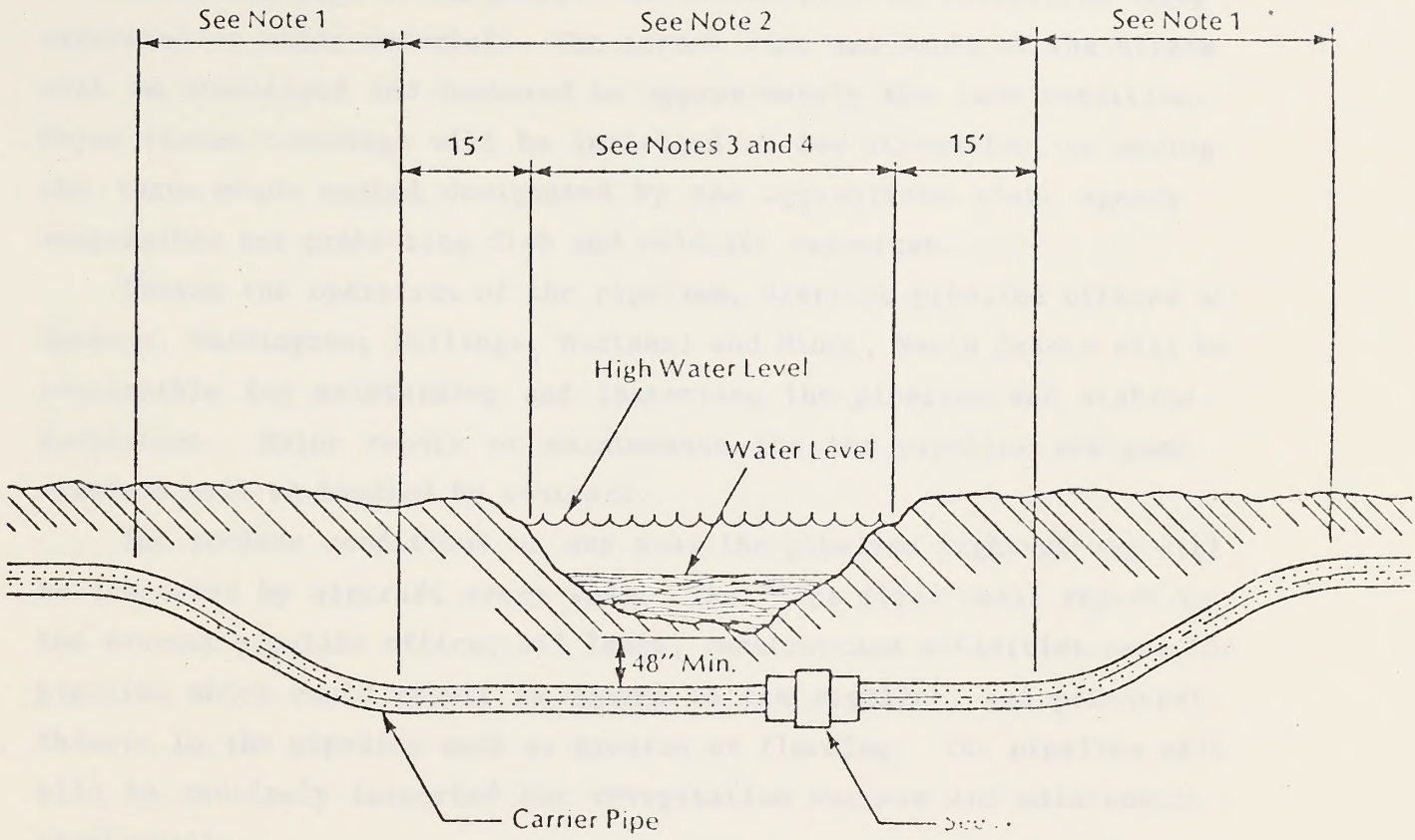
the trench line. Any excavated material deemed unsuitable for use as backfill or surplus to need will be disposed of in a manner acceptable to the property owner. The entire pipeline route will be revegetated as described in the revegetation guidelines.

Pipeline crossings of highways, roads, and railroads will be accomplished by methods determined by authorities having jurisdiction. Major highway and railroad crossings are normally bored and cased with a steel pipe large enough to allow the installation of the main or carrier pipe through the casing. Where the roads are unimproved or boring is impractical, the crossing may be constructed by open cutting.

Along the route, a number of waterways will be encountered, varying in width, depth, water flow, and terrain. Submerged crossings will be constructed so the pipe would be 4 feet below the scour level of the streambed. The ends of the crossing pipe will extend into the banks of the waterway beyond the point of high water scour. Figure 2.3-4 illustrates typical stream crossing requirements. At all major water crossings, wall thickness of the pipe will be increased by twenty percent and an additional thickness of anticorrosive coating will be applied. Continuous concrete coating or individual concrete weights will be applied to provide the weight required to keep the pipeline buried beneath the stream bed.

Design of crossings will be in accordance with the requirements of permitting agencies. The method of excavation and construction of the crossing will depend on the characteristics of the waterway. If the stream bottom contained solid rock, drilling and blasting will be required to secure the necessary trench depth. As on land, blasting for stream crossings will use multiholed, low intensity charges sufficient to fracture the rock without scattering debris over large areas.

The construction procedure for stream crossings will include welding of pipe sections on land, examining the welds, applying protective coatings, adding weight in the form of concrete coating to the pipe as required, and hydrostatically testing the pipe sections. All work to be done on the pipeline will be completed on land before installation in the stream. The crossing pipe will be retested after installation as a part of the testing of the completed pipeline. Empty pipe will be carried or floated into position with the aid of floats tied to



NOTES:

1. This distance will vary depending upon terrain.

2. Pipe shall be level under stream channel to the depth shown above except in rock formations where top of pipe may be laid to a minimum of 18" below stream bed.

3. Contractor shall furnish and install concrete weights per specifications and as shown on applicable drawings. Alternatively, concrete coated pipe may be furnished to contractor.

4. For high water widths over 100 ft., continuous concrete coated pipe will be furnished by company and installed by contractor.

Figure 2.3-4. Typical stream crossing requirements (Source: U.S. Bureau of Land Management 1979).

the pipe and lowered into the trench by disconnecting the floats. On short and shallow crossings, the pipe will be placed directly in the trench with sideboom tractors.

After the pipe is in place, the trench will be backfilled using excavated or other material. The trench line and banks of the stream will be stabilized and restored to approximately the same condition. Major stream crossings will be installed at low streamflow, or during the three month period designated by the appropriate state agency responsible for protecting fish and wildlife resources.

During the operation of the pipeline, district pipeline offices at Spokane, Washington; Billings, Montana; and Minot, North Dakota will be responsible for maintaining and inspecting the pipeline and station facilities. Major repair or maintenance for the pipeline and pump stations will be handled by contract.

The surface conditions on and near the pipeline right-of-way will be inspected by aircraft every week. The "line flyer" will report to the nearest pipeline office; oil leaks, construction activities near the pipeline which could result in damage to the pipeline, and potential threats to the pipeline such as erosion or flooding. The pipeline will also be routinely inspected for revegetation success and maintenance requirements.

Underwater crossings of navigable waterways will be inspected to determine their condition at intervals not exceeding 5 years as required by Department of Transportation regulations.

The communications system will link the port, district office, and pipeline system with the main control center at the onshore storage facility.

2.4 Abandonment

At some point in the future the operation of the proposed system may be discontinued. Conditions such as insufficient crude oil or other economic situations could terminate the operation of the entire system. Terminating operations would lead toward abandonment and possible disposal of all or portions of the entire system. The abandonment procedures used would be subject to appropriate existing local, state, and federal regulations.

Port and Onshore Storage Facilities. Should abandonment procedures be implemented at the port, some components at the tanker berthing structures would probably not be taken out of service. The disposition of the cargo handling equipment, submarine pipelines, and support facilities would depend upon abandonment procedures and modified future uses of the facilities. Crude oil remaining in the system would be drained to the onshore storage facility, the equipment disconnected, sealed, secured, and possibly removed for salvage.

Abandonment of the onshore facility would require storage tanks to be dismantled and disposed of. All oil and other combustible materials would be removed.

Pipeline System. If the pipeline system were abandoned, removal of the crude oil from the pipeline could be accomplished by displacing it with water obtained from local sources along the route. Selected pumping units would be used to gradually displace the oil and water into delivery facilities. If removal of the water from the system were required, truck transport would be used to deliver the water to oil-water separators. Retaining water in the pipeline system would require addition of a corrosion inhibitor.

Removal and salvage of the pipe and main line valves would require activities similar to construction of the system but with a simplified work scope. Some sections of pipeline might not be removed; for example, river or road crossings. The ends of the pipeline on both sides of the crossing would be sealed and covered with soil. Additional backfill might be required to restore the right-of-way to its original condition. After the pipe had been removed the rights-of-way would be revegetated.

3.0 ENDANGERED SPECIES EVALUATIONS

3.1 Bald Eagle

3.1.1 Introduction

The bald eagle (Haliaeetus leucocephalus) is a bird of prey inhabiting areas near coasts, rivers, and large bodies of water throughout North America. Two subspecies are recognized. The northern bald eagle (H. l. alascanus) breeds across the northern half of the U.S. north through Canada to the Alaskan peninsula, and west through the Aleutian Islands to Bering Island (A.O.U. 1957). The southern bald eagle (H. l. leucocephalus) is smaller than the northern subspecies and generally breeds and winters south of the northern subspecies range, though wintering ranges may overlap. The total continental population is estimated at between 35,000 and 60,000 eagles, mostly occurring in Alaska and Canada (Brown 1975). Approximately 1,000 pairs of northern bald eagles breed in the conterminous U.S. with largest populations occurring in the Northwest (Washington and Oregon), the Great Lakes (Minnesota, Wisconsin, and Michigan) and the Northeast (Maine and Chesapeake Bay) (U.S. Army Corps of Engineers 1979). Largest wintering concentrations occur in the Klamath Basin, California, in the midwestern states along the Mississippi, Missouri, Illinois, Platte, and Arkansas Rivers, and the Northwest encompassing Washington, Oregon, Idaho, and Montana.

Human activity has contributed to the recent decline in bald eagle populations. The bald eagle is very sensitive to factors affecting population size because of its late attainment of sexual maturity and its low productivity rate. Since bald eagles are top carnivores in food chains, they are especially susceptible to bioaccumulation of pesticides. Accumulation of persistent chlorinated hydrocarbon pesticides such as DDT and its metabolites have resulted in eggshell thinning and thus lowered productivity (Wiemeyer et al. 1972), causing declining populations (Sprunt et al. 1973). Shooting for sport or for protection of livestock has in the past destroyed at least 75% of the annual production on San Juan Island, Washington (Retfalvi 1965), and affects the use of important wintering areas (Steenhof 1978).

The decline in populations prompted the U.S. Fish and Wildlife Service to review the status of the bald eagle. In March 1967 (Federal

Register, March 11, 1967) the southern bald eagle was considered "endangered" throughout its range (U.S. Army Corps of Engineers 1979). In 1978 (Federal Register, February 14, 1978) the northern bald eagle was given the status of "endangered" throughout the conterminous U.S. except in Washington, Oregon, Minnesota, Wisconsin, and Michigan, where it is considered "threatened".

3.1.2 Life History

The breeding season of the bald eagle varies with latitude. It begins with the return of the mated pair to the nesting territory. In Washington, bald eagle nesting activity is first observed in January and February (Retfalvi 1965). A large nest is built of sticks and lined with smaller sticks, twigs, grass, and down. Alternate nests may also be present in the breeding territory. The same nest is used each year, and is supplemented with new nest material or rebuilt if destroyed. Nest size varies from 3-4 feet in diameter and 1-2 feet deep to 8-5 feet in diameter and 12 feet deep (Retfalvi 1965). Preferred nest sites are trees taller than the surrounding canopy, usually near an opening such as a marsh or clearing (Juenemann 1973).

Bald eagles reach sexual maturity in 5-7 years (Southern 1967) and appear to mate for life (U.S. Army Corps of Engineers 1979). In Washington eggs are laid March 4-19 and hatch April 8-14 after 34-35 days of incubation (Retfalvi 1965). Clutch size varies from one to three (rarely four) eggs, usually two. If the first clutch is destroyed a second clutch is laid, usually in an alternate nest (Kalmbach et al. 1964). Incubation is shared by both male and female and begins when the first egg is laid, resulting in different aged nestlings. Retfalvi (1965) found that young eaglets in Washington were fed primarily fish during the first 6 weeks, after which they were fed rabbit carrion. Both parents bring food to the nest though generally the female feeds the young. After about 7 weeks the young are able to feed alone. Parental care decreases after 8-9 weeks when the young begin wing exercises. Around 13 weeks the young are flying and are ready to leave the nest. In Washington young fledge in July (Grubb 1977). Young bald eagles feed on carrion until flying skills are developed sufficiently to catch fish, the preferred food.

Breeding success and productivity vary throughout the range. Many mature eagle pairs do not breed every year (U.S. Army Corps of Engineers 1979). In Alaska the average number of young produced was 1.0 per nest attempt (Chrest 1964) and in the Great Lakes area was 0.14 young per nest attempt (Sprunt et al. 1973). In Washington the average was 1.37 young per successful nest, 0.86 per active nest, and 0.75 young per occupied nest (Grubb 1976).

Bald eagles migrate south during September-December, wintering as far north as open water and food are available (U.S. Army Corps of Engineers 1979). Wintering eagles usually gather along lakes and major river systems, but may use arid valleys (Edwards 1969). Eagles wintering in the northwest concentrate along rivers and streams to exploit the food source provided by salmon runs. In the midwest important wintering areas include national wildlife refuges, dams providing open water and a source of fish, and waterfowl hunting areas providing avian prey and carrion (Steenhof 1978). Bald eagles gather in large aggregations on the wintering grounds, sharing communal roosts, diurnal perches, and feeding areas. During winter a greater variety of food is taken including fish, dead or crippled waterfowl, and carrion (U.S. Army Corps of Engineers 1979). Eagles remain in one area until the food source is depleted, then move to a new area in search of food (Servheen 1975). Northward movements occur from late January to May as the lakes and rivers thaw and pairs return to nesting territories (U.S. Army Corps of Engineers 1979).

3.1.3 Habitat Requirements

Bald eagle nesting territories may vary with geographic area, but various components are important to all territories. Optimum nesting habitat in Washington includes proximity to open water providing a food source, large nest trees with sturdy branches at sufficient height, and stand heterogeneity (Grubb 1976). Oldgrowth and uneven stands are preferred, with diversity in crown dominance and crown cover (Grubb 1976). In Minnesota Juenemann (1973) found eagle nests to be within one half mile of water, and in Washington Grubb (1976) found all coastal eagle nests were within 200 yards of water. Preferred nest sites are in old-growth trees extending above the canopy that allow clear visibility of the surrounding area and an open flight path. Nest trees are usually

less than 25% dead, often with broken tops, and with moderate to dense foliage above the nest and moderate to light foliage around the nest (Grubb 1976). Size of nest trees may vary from 59 to 112 feet high with a dbh ranging from 20.7 to 30.7 inches (Juenemann 1973). Common species include red pines, white pines, aspen, and balsam poplar in Minnesota (Juenemann 1973) and Douglas fir and Sitka spruce in Washington (Grubb 1976). A pilot tree is often used for perching near the nest, and may be a snag with lateral limbs, usually the closest dominant tree within 100 feet (U.S. Forest Service 1977). Thirty-eight percent of the breeding territories in Washington contained alternate nests (Grubb 1976). Distances between primary and alternate nests ranged from 0 (same tree) to 1.2 miles with an average of 350 yards (N = 74). Minimum distance between territory nests averaged 3.3 miles in Washington, but varies with habitat and density of eagles.

Human disturbance can be an important factor in nesting success (Grubb 1976). Grubb found the average distance of disturbance near productive nests to be 130 yards and for unproductive nests 80 yards. The U.S. Forest Service (1977) and the U.S. Fish and Wildlife Service (1977) have advocated a 5 chain (110 yd) protection zone around nests with various restrictions of activity up to 20 chains (440 yards) distant. Juenemann (1973) suggested increasing the buffer zone to a 160 acre unit around the nest with a 20 chain radius. The aspect of human disturbance is hard to evaluate; contributing factors include history of habitat use, existing habitat quality, occupation of surrounding habitats by eagles, and acclimation of eagles to human disturbance. It appears that in Washington nests are commonly located near such disturbances as timber cuts, boat traffic, and housing developments and that other habitat characteristics such as food supply might be more important.

The major components of habitat on the wintering grounds include a food source and suitable trees for diurnal perching and roosting. Bald eagles rely on open water as a source of fish, though food habits are diverse enough to include carrion and crippled waterfowl (Steenhof 1978). Maintenance of habitat for fish, upland game, and waterfowl can help to insure an adequate food supply for wintering eagles. Diurnal perches near food sources are important to offer increased visibility of waterways and open areas. Cottonwoods are preferred perches in South

Dakota and bigleaf maple are preferred in Washington. Sitka spruce is preferred because of its height and proximity to water (Stalmaster 1976). Other conifers are probably avoided because the dense foliage decreases visibility. Bald eagles along the Kootenai River in northwestern Montana preferred perch trees of Douglas-fir and cottonwood 50-150 feet high, within 50 feet of the river (Craighead and Craighead 1979). Stalmaster (1976) found preferred diurnal perches in Washington were usually dead trees with many lateral branches. Night roosts were often in conifers, possibly because of thermoregulatory effects.

Human disturbance can adversely affect use of important wintering areas (Stalmaster and Newman 1978). Vegetation buffer zones decreasing the line-of-sight contact between eagles and humans may allow closer presence of humans without disrupting eagle feeding and perching activities. Stalmaster and Newman (1978) recommend vegetation zones 75-100m wide to protect critical wintering areas where disturbances are common. Critical areas include roost trees and important feeding areas. Disturbance by fishermen and boats along rivers was greatest when irregular in occurrence (Stalmaster and Newman 1978).

3.1.4 Presence in Project Area

Bald eagles are present near the Northern Tier facilities in Washington, Idaho, Montana, and North Dakota. Breeding eagles occur along the Strait of Juan de Fuca and various areas in Puget Sound (MSN 1978). Grubb (1976) found 218 bald eagle nests in 1975 along western Washington's marine coastline. One-hundred and forty-four nesting territories were defined of which 114 were occupied. Of 100 nests, 63% were successful and 86 young were produced. Nest sites within the influence of the NTPS in Washington include a nest tree at the Green Point onshore storage facilities and an active nest at Polnell Point on Whidbey Island. No breeding eagles are known to nest near the pipeline in the other states with the exception of one nest about 7 miles upstream from the stream crossing location on the Blackfoot River, in Montana (Servheen 1980). Other nest sites in Idaho, Montana, and Minnesota occur away from the pipeline corridor.

The nest tree at Green Point is on private property adjacent to the Northern Tier property along the west bank of Siebert Creek. The nest

was confirmed by Don Bakker, Conservation Officer, of the Washington Department of Game on March 23, 1979; however, most of the nest had been blown out by this date. The nest site was visited again by ERT in July and at this time only a few branches remained in the tree. In April 28, 1980, ERT and Richard Howard of the U.S. Fish and Wildlife Service visited the nest tree and found no new nest or nest materials. George Allen, Research Assistant, Washington Eagle Study, Washington Department of Game collected habitat information on the nest tree in late April 1980. At this time, he observed prey remnants at a dead snag near the nest tree and observed two adult bald eagles which vocalized in a defensive manner (Allen 1980).

The active nest at Polnell Point was recorded in studies by Grubb (1976) and MSN (1978). Upon inspection of the nest on April 28, 1980, by ERT and the U.S. Fish and Wildlife Service a bald eagle was observed sitting on the nest. There are two nests located adjacent to each other on a small peninsula about ½ mile from shore. Existing disturbance includes a residence at the base of the peninsula about ½ mile away and pleasure boat and fishing boat traffic in the other three directions.

Wintering and migrating bald eagles occur along the Strait of Juan de Fuca and Puget Sound in Washington and major rivers and lakes in Washington, Idaho, Montana, and North Dakota. Large concentrations of wintering eagles occur along the Skagit and Nooksack Rivers in Washington (Servheen 1975; Stalmaster 1976). During winter censuses of eagles, concentrations are lower along the strait and in various bays along the sound than in the large rivers. Using 1978-79 winter data, peak eagle observations numbered about 10 eagles for the Dungeness River, 3 for Dungeness Point, 2 for Sequim Bay, 4 for Port Susan, 16 for Skagit Bay, 1 for Camano Island, 247 for Skagit River, 1 for North Fork Stillaguamish River, 33 for Snohomish Estuary, 9 for the Skykomish River, and 3 for the Columbia River (Wenatchee to Crescent Bar) (Knight and Friesz 1979).

Lake Coeur d'Alene is used by wintering eagles in Idaho (Lint 1975). Wintering eagles in Montana occur along the larger rivers where ice free water is present. Near the proposed Northern Tier pipeline route winter bald eagle concentrations in January 1979 included 12 at Holter Dam along the Missouri River, 30 between Missoula and St. Regis

along the Clark Fork River and 18 between St. Regis and Thompson Falls along the Clark Fork River (Servheen 1980). In North Dakota eagles winter below Garrison Dam and some scattered sightings have been reported for the Yellowstone and Missouri River near Williston.

3.1.5 Impacts on Bald Eagle

Noise, human activity, and habitat loss associated with construction could decrease potential nesting and rearing success of bald eagles at Polnell Point and possibly Green Point in Washington. Polnell Point has two nest sites adjacent to each other; eagles used one of these nests in 1979 and 1980. These nests are about 1/2 mile from the submarine pipeline centerline from Polnell Point on Whidbey Island to Browns Point on Camano Island. If submarine pipelaying activities or staging activities for the submarine pipeline were to occur during the period of January 1 through July 31, it is possible the eagles would not nest or that nest failure would occur.

The habitat disturbance at Green Point is more difficult to evaluate. Only one nest is known to have been built at Green Point. This nest was constructed in 1979 and was destroyed before egg laying could be confirmed. The nest was blown out of the tree in late February or early March 1979. The nest tree could be a potential nest site in the future. The quality of the surrounding habitat will be decreased by construction of the onshore storage facility for Northern Tier. The nest tree and other known hunting perch sites will not be removed by Northern Tier; the land on which these trees are found is owned by a neighboring private land owner.

Construction of the pipeline should not cause adverse impacts to wintering or migrating bald eagles. Eagles in the Skagit Flats area are not likely to be in the vicinity of the pipeline if it is constructed in the summer as planned. If it was constructed in the winter months, eagles would generally be several miles from the construction area. Crossing of rivers is to be completed in June through September when streams are at low flow and also when low impact to salmonids would occur. Thus, wintering eagles feeding along the Dungeness, Stillaguamish, and Skykomish Rivers of Washington and the Clark Fork and Missouri Rivers in Montana will not be influenced by the construction activities.

Potential operational impacts on bald eagles would be associated with activities at the tanker unloading facilities and the Green Point storage facilities, and with potential oil spills. Port Angeles Harbor receives a great deal of boat, ship, and log raft traffic at present (about 7,000 vessels/year not including ferry, fishing and recreational craft), and is not known to concentrate wintering eagles. Because few eagles use the harbor and Northern Tier will only be a small increase in harbor traffic, impacts on eagles from the operation of oil tankers in the harbor are not expected.

Operational activities at Green Point will likely reduce the value of the nest tree and hunting perch trees at Green Point. Existing intrusion by man includes a subdivision located about 600 yards to the west, two houses in direct sight about 200 yards to the northeast and a number of houses about 800 yards to the east. The storage site has also been selectively logged. Northern Tier proposes to clear vegetation to within about 170 feet of the nest tree and thus will further intrude into the potential nesting habitat. The nest tree is not likely to be used in the future should this occur.

Potential oil spills are the primary threat of operational impacts. Both wintering and breeding eagles can be affected by oil spills, ruptures or large leaks. Any spilled oil could damage the primary food species for eagles and thus indirectly reduce the eagle population. If the NTPS provides service to the northern Puget Sound refineries, tankers in transit in greater Puget Sound would have a probability of having a 2000 to 10,000 barrel spill once in 11 years versus once in 13 years at present (Oceanographic Institute of Washington 1980). The probability of a greater than 10,000 barrel spill would increase from once in 32 years at present to once in 27 years after the construction of the NTPS with service to the northern Puget Sound refineries (Oceanographic Institute of Washington 1980). Under adverse seas, a spill of 2,000 barrels or more would be difficult to contain and clean up. Large portions of the Strait of Juan de Fuca could be affected if a spill were not contained. The northern Puget Sound is less likely to be affected by a tanker casualty than the Strait of Juan de Fuca. This is because tankers would be off-loading at Port Angeles.

In the Strait of Juan de Fuca and Puget Sound, important food items for bald eagles are gulls, pigeon guillemots, cormorants, puffins, Pacific herring, Pacific salmon, dolly varden, cutthroat trout, flatfishes, sculpins, sea urchins and crabs (Simenstad et al. 1979). Impacts on these food items by potential oil spills will depend on which habitats are impacted and the season in which incidents occur. Pacific herring and larval fishes (prey for the piscivorous birds) and their prey sources have the greatest potential for significant impact in March through June in nearshore mud/eelgrass habitats such as Dungeness and Skagit Bays (Simenstad et al. 1979). Juvenile salmon occupy neritic habitats through late fall and early winter and do not appear to be as vulnerable. Most of the salmon when actually eaten by eagles are dead or dying spawners from the river systems. Potentially, salmon or trout migration could be reduced or stopped at river mouths until the oil is contained or drifts away from the river mouth area. The bird species which serve as prey for eagles are most vulnerable during the breeding season when the birds may either die directly, contaminate their eggs with oil, or lose a food source. These birds are most abundant along the Pacific coast of Washington, eastern Strait of Juan de Fuca and northern Puget Sound. Depending on the location of a spill, thousands of birds could be vulnerable throughout the year to oil spills in the greater Puget Sound region. Port Angeles harbor area has some of the lower concentrations of waterbirds; Tatoosh Island, Skagit Bay, and Dungeness Bay have some of the highest concentrations.

A pipeline break could also affect eagles by damaging prey populations such as salmonids. The most important rivers crossed by the NTPC route which are used by eagles include the Dungeness, Stillaguamish and Skykomish Rivers in Washington and the Clark Fork and Missouri Rivers in Montana. If the northern Puget Sound refineries are serviced with a spur pipeline from Arlington to Burlington, the Skagit River could also be damaged by an oil spill. The segments of these rivers vulnerable to oil spills do not have large wintering eagle populations. The Skagit River has large numbers upstream but not near the potential crossing near interstate highway I-5. However, an oil spill during upstream migration could retard or eliminate the salmonid spawning run. The probability of

a pipeline rupture at one of these river crossings is low, generally less than once in 750 years (Oceanographic Institute of Washington 1980).

There is no known literature which indicates that eagles will eat oil contaminated prey and if they do eat contaminated prey, that the effects will be harmful. However, the U.S. Fish and Wildlife Service is currently conducting research on the mallard duck with respect to ingesting contaminated food (Biderman and Drury 1980). Adult mallards fed oil-contaminated diets were able to eat large quantities of oil without experiencing ill effects. If the birds were already in a "stressed" condition, such as being in a just above freezing environment, the oil in the diet caused a significant adverse effect. A sublethal effect on mallards which ingested oil in their diets over a 90-day period was a 50% reduction in egg production. Petroleum in their systems seemed to retard maturation of the egg cells. The trace metal, vanadium, appears to interfere with calcium metabolism in laying female ducks, which can affect eggshell formation and growth of the embryo's bones. Mallard ducklings fed oil in their diets suffered from liver and kidney damage and slower behavioral reactions. Those ducklings fed higher concentrations failed to develop flight feathers and growth was seriously inhibited. The adult birds can also pick up oil on their feathers and pass the oil on to their clutch of eggs. When the oil level was high, the hatching success was low but only a slight reduction in hatchability occurred under low oil concentrations.

These studies of the mallard may have some implications for the bald eagle. It is likely that the adult eagle would not be harmed by ingesting oil-contaminated food but the young could suffer behavioral or growth problems if they were fed contaminated food. Eagles are not likely to get their plumage oiled since they do not swim and would likely transmit only small amounts of oil on their feet, and thus oiling of eggs is not likely.

Northern Tier has prepared a detailed oil spill contingency plan for the marine waters and for the area of the terrestrial pipeline to Arlington. They also have a generic plan for all segments of the terrestrial pipeline. A detailed contingency plan will be prepared before operation of the pipeline. The plan includes protective measures (such

as keeping oil out of sensitive areas by using diversion booms) and clean-up measures. Northern Tier will have a number of ecological experts available to respond on short notice to go to a spill site and evaluate the resources at risk. These experts would work with other individuals on the oil spill evaluation team and government agencies to initiate an action plan. The action plan will use the oil spill contingency plan and natural resources data to formulate a protection, clean-up and monitoring program for oil spills.

3.1.6 Proposed Alternative Actions and Conservation Measures.

Conservation measures should be instituted which follow the U.S. Fish and Wildlife Service (1977) Washington - Oregon Bald Eagle Guidelines. Conservation measures to protect the Polnell Point nest site should include no clearing of the woodlands on the small peninsula. No onshore staging should occur at the base of Polnell Point and no pipe laying activities should occur within a mile of Polnell Point between February 1 and July 31. However, if the nest site on Polnell Point is unsuccessful (that is, no incubating bald eagles present or young hatched and alive) by May 15, then Northern Tier should be given approval to proceed with the submarine pipeline construction program in that area. The Strawberry Point to Browns Point alternative route has been proposed to avoid the eagle nest site but was judged unacceptable because of potential contamination of ground water for a subdivision by potential terrestrial oil spills.

Conservation measures to be implemented to protect the nest tree and hunting perch trees at Green Point should include not clearing any vegetation within 330 feet of the nest tree, maintaining a minimum of 180-foot woodland buffer from the hunting perch trees along the west ridge of Siebert Creek, and not constructing within 660 feet of the nest site during the period of January 1 through July 31. If a successful nest (that is incubating bald eagle or young hatched and alive) is not present by May 15, construction within 660 feet may be initiated. All aircraft flying in vicinity of the storage site should remain at least ½ mile from the nest tree between February 1 and July 31. These measures conform to the Fish and Wildlife Service guidelines.

Other than the two nest sites in Washington (Polnell Point and Green Point) no other nest sites are known to occur within one mile of the pipeline centerline. A wildlife biologist will inspect the centerline during the surveying process. If potential conflicts with any threatened and/or endangered species is encountered, the wildlife biologist will contact the appropriate endangered species team. If a nest is located within one-half mile of the pipeline, the pipeline should be relocated to be at least one-half mile away if possible.

The impacts from oil spills should be reduced through preparing detailed oil spill contingency plans for all marine feeding areas within the influence of a potential spill for rivers and inland waters including Dungeness, Skagit, Stillaguamish, Skykomish and Columbia Rivers in Washington, St. Joseph and Coeur d'Alene Rivers in Idaho, and Clark Fork and Missouri Rivers in Montana.

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3.2 American and Arctic Peregrine Falcon

3.2.1 Life History

The peregrine falcon (Falco peregrinus) is a raptor of mountainous areas and riparian habitat. Two Western Hemisphere subspecies historically nested and wintered throughout North America. Peale's peregrine (F. p. pealei) breeds along the coast of British Columbia, the Alaskan coast and the Aleutian Islands (Snow 1972). The anatum or American peregrine falcon (F. p. anatum) breeds throughout Canada and the United States, and winters in Mexico and central South America. The Arctic peregrine falcon (F. p. tundrius) nests in the Arctic and winters on the Atlantic coast and Gulf coast of Texas, occasionally wintering as far south as Argentina. Habitat destruction and pesticide contaminants causing egg-shell thinning have combined to eradicate the peregrine in much of its range, resulting in very limited breeding in the West and no breeding east of the Mississippi River. This startling decline resulted in F. p. tundrius and F. p. anatum being placed on the U.S. endangered species list in 1973 (Federal Register Vol. 38:14678). Since 1978-1979 breeding has occurred in Colorado, New Mexico, Arizona, Texas, Utah, California, and Washington (Burnham 1980). No known occupied eyries have been sighted in Idaho, Montana, North and South Dakota, Oregon, or Nebraska. Current population numbers are unknown (Burnham 1980).

Breeding phenology in the peregrine falcon varies with latitude throughout the range. Peregrines reach sexual maturity around two years of age and mate for life (replacing only mates that die) (Snow 1972). A strong nest site attachment insures the pair's yearly return to the eyrie in mid-March. The female lays a clutch of 3-4 eggs in April, laying a second clutch if the first is destroyed. Both male and female incubate, with the female performing most of the incubation while the male provides most of the prey. After 33 days of incubation the young hatch, and are fed, brooded, and defended by both parents. Fledging occurs mid-June to mid-July, and soon afterwards the young are independent. Annual mortality has been estimated at 50-55 percent for juveniles and 20-25 percent for adults, with a life expectancy around 4 years (American Peregrine Falcon Recovery Team 1977). The peregrine's high position on the food chain greatly increases the problems of pesticide accumulation, causing behavioral and physiological changes resulting in reproductive

failure (Snow 1972). Pesticide poisoning is the major factor preventing the peregrine population from sustaining itself (Burnham 1980).

Peregrine falcons hunt in riparian habitats, preying on the abundant bird population of rivers, lakes, marshes and meadows. A wide variety of species are taken including columbids, songbirds, shorebirds, and waterfowl. Prey is caught by the peregrine diving at high speeds and knocking the prey to the ground (Snow 1972).

Little is known about post-breeding movements. Peregrines may winter near the eyrie in Arizona and Texas if the prey base is sufficient (Burnham 1980). Migration and wintering are often associated with large rivers or waterfowl refuges such as Monte Vista Wildlife Refuge in Colorado and Bear River National Wildlife Refuge in Utah (American Peregine Falcon Recovery Team 1977).

3.2.2 Habitat Requirements

The four major requirements for nesting are 1) a suitable nesting site, 2) an adequate prey base, 3) proximity to water, and 4) isolation from human disturbance (Haynam and Sumner 1977). Peregrine falcons nest predominantly in mountainous areas near rivers, lakes, or marshes. Formerly peregrines nested near all mountain plant community types, but now most active eyries are near scrub-oak or pinyon-juniper communities (American Peregine Falcon Recovery Team 1977). Behle and Perry (1975) found peregrine nests in Utah usually were within one-half to one mile of water. Nests in the Rocky Mountains are on cliffs and river gorges often over 200 feet high, usually at elevations under 8,500 feet. Nest sites are usually on open ledges with an eastern or northern exposure. Nest ledges in Utah averaged 105.5 feet above the cliff base and 68.6 feet below the cliff edge (Porter and White 1973). The nest ledge often has an overhang, and must have loose soil, sand, gravel, or dead vegetation to allow the peregrine to construct a scrape for laying eggs (Enderson and Craig 1974; Cade 1960).

Preferred hunting areas include cropland, meadows, marshes, lakes, and rivers, where birds, the prey base, are abundant. Peregrines will fly as far as 17 miles from the eyries to hunt, but a marsh or river nearby can greatly increase the attractiveness of a nesting cliff (Porter and White 1973). Water is not required for drinking but is important for bathing (Snow 1972).

Peregrines are not very tolerant of human disturbance, and may desert an eyrie if humans are seen in the vicinity (Snow 1972). The loss of habitat free from human disturbance was an important factor in the decline of peregrines in the eastern United States.

3.2.3 Presence in Project Area

The peregrine falcon occurs in the project area as a wintering species and a migrant. No known eyries occur within the pipeline corridor. Peregrines migrate through North Dakota (Nelson 1980) and Idaho (Norell 1980) and migrate and winter in Montana (Flath 1980). In Washington, peregrines occur as nesting, wintering, and migrating birds. From 5 to 10 active eyries of the anatum peregrine falcon occur in Washington. Spring and summer sightings in and near the construction corridor indicate that 1 or 2 probable nesting sites occur (Dobler 1980). Sightings of wintering birds have been recorded within the corridor where it crosses the Strait of Juan de Fuca between Port Williams and Whidbey Island and also north of the corridor at Skagit Flats. The Washington Harbor-Dungeness-Diamond Point area is known historically and currently as an important wintering area for about 4 peregrines.

3.2.4 Impacts on Peregrine Falcon

Impacts of the NTPS on peregrines may involve construction phases, or oil spills. Construction March-July could interfere with or prevent successful nesting of peregrines if they were nesting within the corridor. A submarine oil spill in the Strait of Juan de Fuca from Port Angeles to Skagit Flats could impact the peregrine by damaging food species such as shorebirds or waterbirds. Migrating and wintering birds could suffer from loss of prey species during fall and winter. As with bald eagles, young peregrines may suffer behavioral or growth problems if fed contaminated food. Food web related impacts are discussed under oil spill impacts for the bald eagle. The probability of a significant oil spill is low.

3.2.5 Proposed Alternative Actions and Conservation Measures

Restricting the construction periods to July-February near suspected eyries should avoid problems associated with disturbance of nesting

peregrines. Eyrie locations should be identified based on confirmed sightings from state or federal management agencies. If an active eyrie was confirmed within the corridor, efforts should be made to move the pipeline at least one-half mile from the eyrie.

3.2.6 Literature Cited

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3.3 Whooping Crane

3.3.1 Life History

The whooping crane (Grus americana) is a large migratory bird of marshes and wetlands, breeding in Wood Buffalo National Park, Northwest Territories, Canada, and wintering on Aransas National Wildlife Refuge on the southeastern coast of Texas. Once almost extinct, the population has increased from a low of 21 birds in 1941 to the present high of 84 wild birds in 1979 (Whooping Crane Recovery Team 1980). An extensive program coordinating private, state, and federal agencies has involved transferring eggs from wild and captive whooping cranes to sandhill crane foster parents, thus starting a population of whooping cranes in the Rocky Mountains. These whooping cranes migrate with their sandhill crane foster parents between the breeding grounds in Grays Lake National Wildlife Refuge in southeastern Idaho, to the wintering grounds in the Rio Grande Valley of central New Mexico (Whooping Crane Recovery Team 1980).

3.3.2 Habitat Requirements

Little information is available on the habitat requirements of whooping cranes during migration. The two major habitat components appear to be feeding areas and roosting areas. Preferred habitat includes shallow sloughs, bulrush, cattail, sedge marshes and ponds of interior grasslands (Allen 1952). Foods taken during spring migration include crayfish, frogs, small fish, small animals, and waste grain and insects from cropland (U.S. Fish and Wildlife Service 1977). Allen (1952) also included worms, slugs, snails, lizards, snakes, mice, rats, and some plant materials. Whooping cranes require roosting areas with an open expanse, including many wetlands and sand or gravel bars in rivers and lakes (U.S. Fish and Wildlife Service 1978). Roosting areas on the Platte River are usually large sandbars and flat islands (Allen 1952).

3.3.3 Presence in Project Area

Whooping cranes of the Wood Buffalo-Aransas population migrate through northeastern Montana and western and central North Dakota. Stopovers in Montana include Medicine Lake National Wildlife Refuge and

Lamesteer National Wildlife Refuge. In the North Dakota project area sightings were reported for McKenzie, Mountrail, Ward, McHenry, and Williams Counties. Whooping cranes in Idaho summer at Gray's Lake National Wildlife Refuge and may wander north to south-central Montana. A total of 16 sightings have been recorded within 20 miles of the pipeline corridor since 1955; this includes two within the corridor on Lake Sakakawea.

3.3.4 Impacts on the Whooping Crane

Potential impacts from pipeline construction or operation on the whooping crane are minimal. Whooping crane sightings in North Dakota have all been between April 1 and May 15, and September 9 and November 7, indicating cranes are present in the study area for a very short time each year (Whooping Crane Recovery Team 1980). Sightings also indicate whooping cranes rarely remain in one area for more than 1-2 days, thus adequate food and cover at any one site is not necessarily critical. Because sightings are widely distributed, use of areas appears to be based on factors other than preference for one site. A total of 16 sightings of whooping cranes have been recorded within 20 miles of the two-mile corridor since 1955 (Whooping Crane Recovery Team 1980). Two sightings have been reported within the two-mile corridor on Lake Sakakawea. Whooping cranes may fly over the pipeline route; however, the pipeline avoids most wetlands. Because whooping cranes are long-lived, intelligent, and wary, they will avoid construction activity if suitable habitat exists nearby. Construction procedures include ditch plugs to prevent draining of wetlands through the pipeline ditch. The pipeline ditch will not penetrate through the impermeable strata where perched aquifers are located and thus wetlands should not be lost due to draining. Several sightings have been recorded at Audubon National Wildlife Refuge on Lake Sakakawea downstream of the pipeline crossing. Two individuals have been sighted along Lake Sakakawea, about 30 and 40 miles, respectively, downstream from the pipeline crossing of the Missouri River. A catastrophic spill of several thousand barrels would impact potential crane habitat. Uncontained oil will kill or reduce the growth of riparian vegetation and will likely kill benthic macroinvertebrates, fish eggs and larvae, reptile young and amphibian eggs, larvae and adults. Damaged

aquatic systems may require several years to fully recover. Since whooping cranes do not depend on one site, the loss of food supply in a localized area from an oil spill should not cause any significant impacts. The use of many of the smaller wetlands during migration appears to be random, thus the mobility of the whooping crane will allow it to avoid disturbance from construction.

3.3.5 Proposed Alternative Actions and Conservation Measures

Conservation measures include containment and rapid cleanup of any oil spill. A spill within the migration route during the migration period should be contained and the area watched for whooping cranes, with hazing methods used to keep whoopers from the affected area.

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3.4 Brown Pelican

3.4.1 Life History, Habitat Requirements, and Presence in Project Area

The brown pelican (Pelecanus occidentalis) is a water bird of sandy coastal beaches and lagoons. The range is along the Atlantic coast from North Carolina to Venezuela, and on the Pacific coast from British Columbia to Chile (Bull and Farrand 1977). Nesting occurs on beaches of the mainland and islands of North Carolina and to the south, where 2-3 eggs are laid in a nest of sticks and grass. Brown pelicans that breed in Mexico and California may occasionally occur in Washington, during late summer and early fall in outer coastal waters. Brown pelicans have been reported in Washington 2 miles north of Tatoosh Island on August 1976 and at Neah Bay in August 1975 (McAlister 1980) but have not been recorded in Puget Sound since 1942 and are unlikely to occur there (Mattocks 1980). High residues of chlorinated hydrocarbons in the fish accumulate in brown pelicans and has resulted in egg-shell thinning which in turn has caused drastic declines in brown pelican populations (Schreiber and Risebrough 1972).

3.4.2 Impacts on Brown Pelican and Alternative Actions and Conservation Measures

Because of the rarity of the brown pelican in the project area, impacts from the project are not expected and alternative actions and conservation measures are not recommended.

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3.5 Grizzly Bear

3.5.1 Introduction

The grizzly bear Ursus arctos horribilis is the largest living member of the order Carnivora in North America. It is a large, wide ranging animal whose omnivorous feeding habits allow it to utilize a variety of habitats in remote areas of western North America. Historically the grizzly bear ranged from Alaska, western Canada, and the western continental U.S., to central Mexico (U.S. Fish and Wildlife Service 1977). Its current range includes parts of Alaska and western Canada and remote regions of the lower 48 conterminous United States. The grizzly bear is still relatively abundant in western Canada and Alaska (Craighead, Craighead, and Sumner 1976). In the conterminous U.S., the grizzly bear's present range is confined to isolated regions in Idaho, Montana, and Wyoming where population estimates range from 600 to 1200. The grizzly bear is found in parts of these states where large blocks of national park and forest land provide refuge. These areas are the Yellowstone ecosystem, Glacier National Park and Bob Marshall Wilderness Area, extreme northwestern Montana and Idaho in the Cabinet Mountains, the Selkirk Mountains of extreme northeastern Washington, in the Colville National Forest and Idaho Panhandle National Forest, and the North Cascades.

Since the early 1800s the grizzly bear's range and population numbers have been subjected to intense competitive pressure from man's expansion in the West. Man's activities associated with trapping, hunting, ranching, farming, and timbering resulted in gross changes in the grizzly's native habitats. Bears are taken regularly in control operations where bears threaten livestock operations either through competition for available forage or through direct depredation. Efforts to translocate problem bears to new areas have had limited success since most bears return to their original ranges. Still others are lost to poaching and indiscriminate hunting in areas where bears are considered by many to be "dangerous vermin" (Federal Register 1975).

Although wide ranging and adapted to a variety of habitats and foods, the grizzly bear has always been at relatively low densities and has a very low reproductive rate. As a result, the grizzly bear has been unable to sustain or maintain stable populations in the lower

48 states. These factors, combined with a paucity of population data and the inadequacy of existing regulatory mechanisms to manage grizzly bear, prompted the U.S. Fish and Wildlife Service to determine that the grizzly bear was likely to become endangered with extinction in a significant portion of its range. The grizzly bear was classified as a "threatened species" on July 28, 1975 (FR 1975, Vol. 40, No. 145). As a threatened species, the grizzly is protected by the Endangered Species Act of 1973 as amended in 1978. Critical habitat for the grizzly bear was proposed by the U.S. Fish and Wildlife Service on November 5, 1976 (FR Vol. 41, No. 215). As a result of the 1978 amendments to the Act, proposals to list species and their critical habitats were withdrawn and will require reproposal and supplemental information (FR Vol. 44, No. 45, March 6, 1979).

As of June 13, 1980, the U.S. Fish and Wildlife Service has not designated new critical habitat areas for the grizzly bear under the new 1978 amendments. After the Grizzly Bear Recovery Plan is published in late 1980, new critical habitat designations will probably follow, these designations are likely to be smaller, more closely defined areas than those proposed in 1976 (Harms 1980). The U.S. Forest Service, Region 1, 2, and 4, which contains the Yellowstone Ecosystem grizzly bear population, has drafted a management plan that designates "essential habitat" and prescribes management guidelines for the grizzly bear. However, the U.S. Forest Service Region 1, which manages a large portion of the lands occupied by the northwestern Montana grizzly population has not, to date, adopted these or similar guidelines. Therefore, there are no specific management guidelines affecting the grizzly bear populations that occur near the proposed Northern Tier Pipeline.

3.5.2 Life History

The grizzly bear mates, at most, every other year in the spring. The mating season varies by region and population but generally extends from May to July with a peak in early June (Jonkel 1978). Female grizzlies reach sexual maturity at about 5.5 years of age (Craighead et al. 1974). Studies of the grizzly bear in Yellowstone National Park indicate that female grizzly bears may bear young up to age 22.5 (Craighead et al. 1969). With a possible lifetime of 25 to 30 years in the wild, a female bear may have a maximum of 10 breeding seasons in a lifetime, the average is

probably considerably less (U.S. Fish and Wildlife Service 1977). Grizzly bear cubs are born from late November to February in the winter den (Jonkel 1978). The common litter size is two cubs, but can range from 1 to 4. The young gain weight rapidly and leave the den in spring at about four months of age, weighing about 10 pounds (4.5 kg). Spring is a critical and difficult period for grizzly bears. They are at the end of their stored energy reserves, food is scarce, and climatic conditions limit movements to available food.

Cubs continue to grow rapidly through the summer. By the time they enter the winter den with their mothers in October or November they approach 100 pounds (45 kg) (U.S. Fish and Wildlife Service 1977). Young cubs require a great deal of maternal care. Family groups are closely associated during the cub's first year. Generally cubs stay with their mothers through their second summer. The family group may persist for 2 to 3 years. Survival of cubs during this period is very good (Jonkel 1978).

The bond of family groups is finally broken, apparently due to reduced family contact, when the female comes into estrus in spring and allows male grizzlies to approach. Sibling cubs will usually hibernate together but separate from their mothers during the second winter. Subadult animals in this age group suffer the highest mortality (Jonkel 1978).

Grizzlies exhibit wide and varied daily and seasonal movements. These movements are relative to available food sources, den site requirements, proximity of mates, age, sex and the animal's physical conditions (Craighead 1976). Using radio telemetry, Craighead, Craighead, and Sumner (1976) were able to plot two types of home and seasonal ranges: a discrete well defined one used throughout the year and a summer foraging area connected by a migratory corridor to a late fall-early spring range that contained a winter den site.

3.5.3 Habitat Requirements

Grizzly bear require four essential components in their habitat; space, isolation from man, food, and cover. The nature of the grizzly bear; its large size, energy requirements, and behavior require that it have large expansive areas to roam. Along with space, the grizzly bear

needs a degree of isolation; roads and trails that fragment bear habitat degrade the habitat (Mace 1977, Martinka 1972). Bears avoid areas where the land use has altered natural cover types and man is present such as near settlements, agricultural land, logging and mining operations (Varney, Craighead and Sumner 1976; Mace 1977). Trails and roads bring the grizzly bear into confrontations with man.

Although omnivorous in its feeding habits and able to utilize a variety of food and habitats, food is a limiting factor for the grizzly bear. The grizzly's seasonal movements in any area are relative to available food. In order to sustain grizzly bear populations a habitat must have a wide variety of food sources available from April to November. A variety of sources is critical so that intermittent deficiencies of one or more sources does not jeopardize the population, especially during the critical spring period, primarily April and May; and the predenning period August to October.

The grizzly bear's cover requirements, like its food requirements, vary with season. In general the habitat must provide winter den sites, day bedding sites, and sufficient escape cover for protection and seclusion. In addition grizzly bear require "travel corridors" to important feeding sites. When traveling, bears seek cover to varying degrees, they often travel to or from feeding areas at night or during early morning and evening (Jonkel et al. 1978). These corridors vary, but generally are composed of dense timber, shrubs, or riparian vegetation. Important seasonal habitat requirements are discussed below.

Spring

In spring, after emerging from their winter dens, food is the critical factor for the grizzly bear; most of their higher elevational range is still covered with snow. The mainstay of their spring diet is primarily herbaceous vegetation such as that found along floodplains, stream bottoms, seeps, old burnt areas, grasslands blown free of snow, avalanche chutes and west and south-facing open slopes where exposed slopes allow rapid growth of succulent vegetation (Jonkel 1977). In some areas, where winter kill of ungulate populations results in carcasses or weak and dying animals, carrion is an important component of the diet. Vegetative species utilized as food vary widely by habitat. In

Big Creek, Montana, common horsetail grasses, sedges, glacier lily and spring beauty comprised the earliest spring foods (Jonkel and Cowan 1971). This predominantly herbaceous diet may be supplemented with insects and small mammals as they become available. Grizzlies are consistently observed in spring, in areas exhibiting wide diversity of vegetation (Lloyd and Fleck 1977; Mealey 1975; Shea 1977; Singer 1978; Martinka 1974).

Summer

During late spring and early summer, grizzlies continue to forage in lowlands, along stream bottoms, and in snowslide areas which have cleared of snow. As summer progresses, the bears generally move to higher elevations and continue to feed on a predominantly herbaceous diet of roots and bulbs, commonly wild onion, glacier lily, and kinnikinnik, supplemented with insects, and ripening fruits such as huckleberry and serviceberry. Alpine meadows, krumholz communities, and wildfire-cleared shrublands are most important to the bears in summer although some bears continue infrequent use of lowlands (Husby and McMurray 1979; Servheen 1980).

Lowland areas with riparian vegetation provide important travel corridors to feeding sites. Rugged terrain and areas with dense shrubbery or timber provide daytime bedding sites for grizzly bear (Servheen 1980).

Fall

In late summer and early fall, the grizzly diet consists primarily of fruit (huckleberry, serviceberry, hawthorne, mountain ash) supplemented by various herbaceous plants roots and insects. As fall progresses, grizzlies make greater use of lower elevation coniferous forests and adjacent shrub and snowslide areas, stream bottoms, and floodplains. They continue to use high elevation areas, however, until frosts and early snows preclude use. The heavy diet of fruits usually declines in late October and is replaced by various grasses, roots, insects, ground squirrels, and ungulate carcasses when available. The grizzly is a ravenous feeder in late summer and fall. Grizzlies accumulate much fat which insulates the bears against cold during winter inactivity, and

provides energy for winter birthing of cubs and spring movement to lower elevations; the latter two require considerable energy expenditure.

An infrequent but important, unnatural part of the grizzly summer-fall diet can be human food, food waste, and other items associated with human activities within the grizzly range. Grizzlies, in the past, have been frequent visitors to waste dumps, permanent campgrounds, and temporary campsites (Craighead, Varney and Criaghead 1974).

Cover requirements during the fall are similar to those described for summer. Travel corridors to feeding areas continue to be important. In late fall (October to November) bears move to higher elevations and select winter den sites. Bears utilize a variety of sites for denning. Grizzly bears in the Mission Mountains of Montana construct dens above 1800 m (5905 feet) in "sidehill park habitat" in areas not covered by a forest canopy (Servheen 1980b).

Winter

Grizzlies "sleep-hibernate" roughly from late November through March or early April. The bears may infrequently emerge from their dens and move about for short periods in the immediate vicinity of their dens. Breeding females give birth to cubs (usually two) in their dens usually in January or February. In late March or early April, the bears leave their dens and move to lower elevations to begin feeding in areas free of snow.

3.5.4 Presence in the Project Area

The proposed Northern Tier pipeline route passes near one of the previously proposed critical habitat areas for the grizzly bear (Figure 1-1). This area is part of the "Bob Marshall Ecosystem" which includes Glacier National Park; parts of the surrounding Bob Marshall Wilderness Area; Flathead National Forest; parts of Lewis and Clark, Helena and Lolo National Forests; and parts of the Blackfeet and Flathead Indian Reservations. Bear densities for western Montana are estimated at one bear per thirty square mile area, densities in the Blackfeet and Flathead Indian Reservations and Mission Mountains area is one bear per fifteen square mile area, and densities for Glacier National Park are estimated at one bear per eight square mile area (Servheen 1980). A population of

about 275 to 300 bears use the Bob Marshall ecosystem area. There are another 30 bears in a separate population occurring in the Cabinet Mountains.

At its nearest point, the pipeline passes 4 miles south of the Flathead Indian Reservation near Frenchtown. Grizzly bears have been reported for the McLeod Peak Area on the reservation which is 16 miles northeast of the route near Frenchtown (Servheen 1980). The route currently comes down the Ninemile Creek drainage. Although available habitat is present, grizzly bears have not been sighted in Ninemile Creek for 37 years (Servheen 1980). Current land use in this area is primarily low density settlements with pastureland or irrigated hayfields; there is some limited livestock rearing and a few recreational homes. On the slopes above the drainage, numerous clear-cuts, primarily in ponderosa pine and douglas-fir forest are evident. This human presence probably extirpated the grizzly in this region some time ago. It is possible that grizzly bears could use Ninemile Creek as a travel corridor between the Bob Marshall ecosystem and the Bitterroot and Cabinet Mountains (Jonkel 1980). However, the paucity of observations of bears in recent years would suggest that this movement is not occurring. However, if a population of bears is dependent on a travel corridor from occupied habitat in the Bob Marshall ecosystem to the Bitterroot Mountains then Ninemile Creek is a likely corridor (Servheen 1980).

There are approximately 50 miles separating known populations of bears in the Flathead Indian Reservation from the Bitterroot Mountains. There are numerous roads including Interstate 90 which would have to be crossed by emigrating bears. In addition, current pressures on bears in occupied areas is such that natural emigration resulting from an increase in the population seem very unlikely.

In conclusion, even if the Ninemile Creek area became an important travel corridor in the future current disturbance from other man related activities such as settlements, and highway would more likely influence the success of bears emigrating into the Bitterroot Mountains, than disturbance from pipeline construction and operation.

3.5.5 Impacts

Since no bears are known or suspected to occur in the Ninemile Creek area or anywhere else along the pipeline in Montana, impacts to the grizzly bear are not expected. Construction activities in remote areas might temporarily restrict movements through the areas by grizzly bear. In many areas the pipeline follows existing roads where other human activities probably already preclude use by grizzly bears. If the Ninemile Creek area became a travel corridor in the future, the pipeline would not interfere with these movements except by removing a strip of potential cover. Shrubs will be allowed to reinvade the pipeline except for a 30-foot strip immediately above the pipeline; this strip will be revegetated in a grass community. It is feasible that the right-of-way could provide suitable cover and food for grizzly bears and bears may use the right-of-way as a travel corridor. If this became the case, bears might be vulnerable to illegal hunting and poaching along the right-of-way.

3.5.6 Proposed Alternative Actions and Conservation Measures

No alternative actions or conservation measures specific to the grizzly bear were deemed necessary.

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3.6 Black-footed Ferret

3.6.1 Introduction

The black-footed ferret (Mustela nigripes) is one of North America's most endangered mammals. Along with skunks and weasels, it is a member of the mustelid family and is the only ferret native to North America (Hall and Kelson 1959). First described in 1851 by Audubon and Bachman, it was not reported again for 25 years (Fortenbery 1972, Hillman and Carpenter 1980). Apparently the black-footed ferret was never abundant. Its use by the Plains Indians as a talisman in religious ceremonies suggests it was always quite rare (Henderson et al. 1974). However, few early sightings may be related to the fact that the Great Plains were sparsely populated and there were few observers. Also, ferrets are seldom seen because of their secretive nature and nocturnal habits (Hillman and Carpenter 1980). Many people considered the black-footed ferret extinct until it was observed in South Dakota in 1964 (Hillman 1968). Historically, the black-footed ferret occurred from southern Alberta and Saskatchewan south to Arizona and Texas (Henderson et al. 1974). Its past range coincided with the combined ranges of the black-tailed and white-tailed prairie dog. Current populations are believed to exist in South Dakota and neighboring states. The decline of black-footed ferrets is thought to relate to the decline of the prairie dog resulting from land use changes and extensive poisoning campaigns.

3.6.2 Life History

Black-footed ferrets are nearly always associated with prairie dogs. Besides preying on prairie dogs, ferrets live in prairie dog towns and raise their young in prairie dog burrows. Much of what is known about black-footed ferret biology comes from studies of the one known population of ferrets in South Dakota (Hillman 1968, Sheets and Linder 1969, Henderson et al. 1974). Thus, much of its life history, behavior, seasonal movements and ecological relationships are largely unknown or poorly understood.

The following discussion of life history was taken from Hillman and Carpenter 1980. Black-footed ferrets breed in March and early April. The gestation period is 42 to 45 days. Litters of up to five young are born in prairie dog burrows in late May to early June. The kits remain

in the burrows until late June or early July when their mothers bring them above ground. At this time the young are one-half to three-fourths grown. In early summer, kits most often occupy one burrow. The female may move her litter to burrows where she has made a kill. They remain in the same burrow for several days. As the season progresses, the adult female places her offspring in separate burrows scattered throughout the town. At night she may visit these burrows and the kits may accompany her as she travels about the town. Ferrets are most commonly observed in late summer or early fall, especially in family groups. Adult male ferrets take no part in rearing the young and live a solitary life except during the breeding season. The number of animals necessary to maintain a gene pool for a stable or increasing ferret population is unknown. Efforts to raise ferrets in captivity revealed inbreeding characteristics, which reduce reproductive success and survival. These disorders may occur in small isolated wild ferret populations and may influence their viability (Hillman and Carpenter 1980).

3.6.3 Habitat Requirements

Black-footed ferrets are associated with and appear to be dependent on prairie dogs. Ferret habitat is the prairie dog colonies of both white-tailed and black-tailed prairie dogs. The ferrets decline is linked to the continued decline of prairie dogs. Prairie dog numbers and acres of occupied towns have reduced drastically in recent years because of drastic changes in land use and extensive poisoning programs aimed at eradicating the prairie dog from western rangelands (Linder et al. 1972 and Clark 1978). In the late 1800's and early 1900's, prairie dog populations mushroomed in response to overgrazing by cattle and sheep. By 1916, the U.S. Biological Survey began poisoning prairie dogs throughout the west, drastically reducing prairie dog numbers and probably black-footed ferrets as well (Clark 1978, Clark 1973, Henderson et al. 1974, Smith 1967, Cottam and Caroline 1965 and Cahalane 1954). Prairie dog control programs on federal lands in Wyoming reduced prairie dog towns at the rate of 25,000 acres per year, with a peak in 1969 of 105,079 acres treated (Clark 1973). No statistics on the acres of prairie dog towns poisoned in Montana are available (Flath 1980). In the past, toxicants like monosodiumfluoroacetate (1080) and strychnine

were the most effective at poisoning prairie dogs. However, these chemicals do not break down quickly and also kill ferrets eating poisoned prey (Hillman 1968). Toxicants such as zinc phosphide, that do not cause secondary poisoning are now available for control purposes and are used by several federal and state agencies. However, poisoning on private land is still done primarily with strychnine. Black-footed ferrets have been observed in towns as small as 15 acres, and are known to move in and out of prairie dog towns previously unoccupied (Hillman 1968).

3.6.4 Presence in Project Area

The black-footed ferret has been reported only in the states of Montana and North Dakota along the pipeline route. Most observations and reports of black-footed ferrets in Montana come from the southeastern portion of the state. Of the 20 known ferrets taken in Montana since 1910, 17 were taken in 6 counties in the southeastern portion of the state (Yannone 1973). The most recent known ferret sighting was reported in 1978 when a ferret was seen in a prairie dog town in Carter County (Flath 1980). This town is currently under management by Montana Fish, Wildlife and Parks. The pipeline route and the state in general have not been surveyed for prairie dog towns, most of the large towns (1500 acres) occur in the southeastern portion of the state. Wheatland, Golden Valley, Musselshell, Petroleum and Garfield counties are the counties most likely to have black-tailed prairie dog colonies along the pipeline route (Flath 1980). One confirmed report of the black-footed ferret occurred in Wheatland County in the 1940's (Yannone 1973, Flath 1980).

All of the 25 reported black-footed ferret sightings in North Dakota since 1910 come from southwestern North Dakota and correspond to the black-tailed prairie dog range in the state (Grondahl 1973). The two most recent sightings reported in the literature occurred in 1973 in Bowman and Slope counties in the extreme southwestern corner of North Dakota. Black-tailed prairie dogs do not range north or east of the Missouri River (Hall and Kelson 1959). The proposed Northern Tier Pipeline route crosses only northern counties in North Dakota and does not cross black-tailed prairie dog range. Therefore, the potential occurrence of black-footed ferrets is remote (Hochhalter 1980).

3.6.5 Impacts on Black-footed Ferrets

Black-footed ferrets could potentially be impacted by pipeline construction in those areas where the rights-of-way cross black-tailed prairie dog towns in central Montana. In these areas, pipeline construction would remove a maximum 90 foot strip of prairie dog burrows in the towns they cross. Some direct mortality of prairie dogs and possibly ferrets could result from trenching activities. Black-footed ferrets would be most vulnerable to disturbance from April to early July when young ferrets are confined to prairie dog burrows and exhibit limited movements. Besides direct mortality and a loss of habitat, ferrets could be indirectly impacted by a reduction in the number of prairie dogs available for prey. If ferrets could not move to surrounding prairie dog towns, a reduction in ferret numbers would be expected. The most recent sighting of a black-footed ferret near the pipeline was recorded nearly 40 years ago in Wheatland County, Montana. Examination of aerial photography of the route in Wheatland, Golden Valley, Musselshell, Petroleum, and Garfield counties did not show extensive prairie dog colonies on or near the proposed route. The probability of ferrets occurring in the prairie dog towns of central Montana is very remote (Flath 1980).

3.6.6 Proposed Alternative Actions and Conservation Measures

Black-footed ferrets historically have been reported in association with prairie dog colonies. Food habit studies suggest the ferret preys primarily on prairie dogs (Sheet and Linder 1969) and young ferrets are reared in prairie dog burrows (Henderson et al 1972, Hillman 1968). Therefore, any measures or practices that ensure the protection and perpetuation of prairie dogs will also favor the black-footed ferret (Linder et al. 1972).

In areas where black-footed ferret occurrence is possible, Northern Tier should locate the centerline outside of black-tailed prairie dog colonies occurring along the route. Prior to construction, the pipeline route should be surveyed (using the U.S. Fish and Wildlife Preliminary Guidelines for Surveying Ferrets on Linear Type Projects), prairie dog towns mapped and the centerline adjusted to avoid prairie dog colonies. All prairie dog town locations and any additional wildlife observations

should be reported to Montana's Fish, Wildlife and Parks nongame biologist. Currently no method exists to discern by direct observation the presence or absence of black-footed ferrets in prairie dog towns. Avoidance is the best technique for mitigating impacts to black-footed ferret (Clark 1980). This conservation measure should eliminate any potential impacts to black-footed ferrets in Montana.

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3.7 Gray Wolf

3.7.1 Life History and Habitat Requirements

The gray wolf (Canis lupus) is a large carnivore of forested regions and semiopen country. Historically, the gray wolf occurred throughout North America but intensive predator control programs extirpated the wolf from most of its range until the federal designation of "endangered" gave the wolf protection in 1973 (Van Ballenberghe 1974). In 1978, the wolf's federal status was changed to "threatened" in Minnesota. Two remnant concentrations exist: One population occurs in varying densities centered in northeastern Minnesota, and consists of 1,000-1,235 individuals (Minnesota Department of Natural Resources 1980). The second concentration is in northwestern Montana, involving 270 wolf reports from 1972-1979 (Wolf Ecology Project 1979) and isolated reports from northern Idaho and northcentral Washington (McAlister 1980). Reports of wolves in Montana, Idaho, and Washington usually involve lone wolves or groups of 2-3; many may be wanderers from British Columbia (Singer 1979).

The pack is the major social unit of the wolf, involving up to 30 individuals sharing the duties of territorial defense, hunting, and raising young (Mech 1974). In normal populations, sexual maturity is reached at 2-3 years of age. Mating occurs January-April and after a gestation period of 63 days, about six young are born. The pack remains in the vicinity of the den during spring, guarding and feeding the young. During summer the pack frequents the pups' summer activity area, usually a small open meadow close to woody cover and surface water. Daily travel becomes more extensive in fall and winter. During this time frozen waterways, lowlands, and streambeds are used as important travel lanes and hunting areas.

Wolves prey predominantly on ungulates such as deer, elk, and moose, and thus require suitable ungulate habitat (Berg and Kuehn 1979). The large home range varies from an average of 40 square miles in Minnesota to 5000 square miles in Alaska, dictating the need for extensive tracts of wilderness to support a healthy wolf population (Mech 1970).

3.7.2 Presence in the Project Area

In Minnesota the end of the pipeline corridor in Clearbrook coincides with the periphery of the gray wolf range. This area supports a wolf density of less than 1 per 100 square miles (Minnesota Department

of Natural Resources 1980), thus the possibility of a wolf encountering the pipeline corridor is minimal.

Wolves have been reported from the Middle and North Forks of the Flathead River, and from an area east of the Continental Divide including portions of Glacier National Park, the Blackfeet Indian Reservation, and the Lewis and Clark National Forest (Ream and Mattson 1980). These areas are north of the project area and are not expected to be affected by the pipeline.

3.7.3 Impacts on Gray Wolf

Because the wolf is highly unlikely to occur near the pipeline, no impacts are expected.

3.7.4 Proposed Alternative Actions and Conservation Measures

No alternative actions and conservation measures are proposed because the gray wolf is not expected to be impacted by the project.

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3.8 Sea Turtles

3.8.1 Life History, Habitat Requirements and Presence in Project Area

The leatherback turtle (Dermochelys coriacea) is the largest species of sea turtles, and wanders great distances at sea (Bustard 1972). They range throughout temperate waters, and breed in tropical areas. Important nesting grounds include French Giuana near the Marowijne River, Trengganu, eastern Malaysia, Costa Rica, and Fiji. Leatherback turtles require substantial breeding areas in stable habitats. The harvesting of these turtles and their eggs has resulted in the species being critically endangered. The leatherback turtle has not been sighted in Washington waters (Tillman 1980).

The green sea turtle (Chelonia mydas) is a large turtle inhabiting the tropics and subtropics where water temperatures are over 20°C (Bustard 1972). Nesting occurs in Tortuguero in Costa Rica, Aves Island in the Eastern Caribbean, and in Australia. Green turtles range throughout the world and may travel to Mexico, Yucatan, southern Florida, Venezuela and Ascension Island. No observations of the green sea turtle have been confirmed for Washington (Tillman 1980). Nesting occurs in colonies on beaches, where females bury an average of 110 eggs in moist, warm sand. Feeding habits are carnivorous for the first year, and include jellyfish or any animal that can be caught. Green turtles over one year of age are usually vegetarian, feeding on marine algae and angiosperms. Feeding areas are in shallow seas with sufficient light for growth of marine grasses, usually on the continental shelf. These areas may be up to 1,000 miles from the breeding grounds (Harless and Morlock 1979). Extensive hunting of green turtles and their eggs have severely depleted their numbers.

3.8.2 Impacts on Sea Turtles

Sea turtles are not expected in the project area, and thus are not expected to be impacted.

3.8.3 Alternative Actions and Conservation Measures

Because sea turtles not expected in the project area, no alternative actions and conservation measures are recommended.

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3.9 Whales

3.9.1 Life History, Habitat Requirements and Presence in Project Area

Gray whales (Eschrichtius robustus) are baleen whales restricted to the North Pacific Ocean, where the eastern population of 16,500 whales migrates along the coast between the summer feeding grounds in the Arctic Ocean and Bering Sea and the breeding grounds off the coast of Baja California (Everitt et al. 1979). These whales pass Washington State March-May and November-January, with a summer population of 50 animals feeding along the west coast of Vancouver Island (Tillman 1980). Gray whales could occur anywhere in the inside waters of Washington but the chance of more than a few stragglers occurring is slight. The 1977 Orca Survey observed eight gray whales; two in the Port Angeles vicinity, two around Bremerton, and four in southern Puget Sound (Balcomb 1978). In general, 20 individuals may be assumed to frequent Washington's inland waters annually (Rich Asborne, personal communication in Simenstad et al. 1979). Environmental Research & Technology sighted gray whales on two occasions in Port Angeles Harbor during field studies in 1978.

Mating occurs late November-early December during the southward migration (Eaton 1975). Females require shallow protected lagoons for calving on the west coast of Baja California, usually within one mile of the beach. Gray whales fast during the southward migration and on the southern breeding grounds (Rice and Wolman 1971). In the north gray whales feed on benthic amphipods and invertebrates, plowing up the soft sandy and silty bottom sediments with their snouts (Eaton 1975).

The fin (or finback) whale (Balaenoptera physalus) is the second largest species of whale, and at one time was considered the most valuable baleen whale. Intensive hunting throughout its worldwide distribution greatly depressed the number of fin whales. Only 10-13,000 remain in the North Pacific population (Eaton 1975). These fin whales summer from California north to the Chukchi sea, and in winter migrate to the southern breeding grounds where mating and calving occur. Finbacks frequent coastal waters, the continental shelf and the open sea seaward. Though rare in Puget Sound and the Strait of Juan de Fuca, fin whales are common in offshore waters. Since 1958 only one fin whale has been observed off the Washington coast. Sexual maturity is attained between 6 and 10 years. Females bear a single calf every 2-3 years after a

gestation period of one year. Food items include euphausiids and small fish, especially anchovies.

The sei whale (Baleanoptera borealis), once considered the second most valuable baleen whale, frequents waters throughout the world along the continental shelf and seaward (Eaton 1975). The North Pacific population, numbering 33,000-37,000, summers from California to the Gulf of Alaska and the Aleutian Islands, and winters to the south where mating and calving occur. Four sitings have been made along the Washington coast since 1958. There are no records of this species from the Strait of Juan de Fuca or other inside waters of Washington (Tillman 1980). Sexual maturity is reached at 6-12 years. Females bear a single young every 2 or 3 years after a gestation period of one year. Feeding occurs near the surface, where the varied diet includes copepods in the far north and in lower latitudes includes euphausiids, copepods, sauries, anchovies, herring, sardines, and jack mackerel.

The sperm whale (Physeter catoclon) is the most important species in the world whaling industry, highly valued for its sperm oil. The distribution is worldwide, with 70,000 males and 184,000 females in the North Pacific population (Eaton 1975). These whales migrate north to the Bering and Okhotsk Seas during summer, and return south during the winter months. Because sperm whales frequent waters offshore from the continental slope, only four have been sighted off the Washington coast since 1958. There are no records of this species occurring in the Strait of Juan de Fuca or the inside waters of Washington (Tillman 1980). Sperm whales are gregarious, occuring in schools of up to 100 individuals. Sexual maturity is reached at 8-11 years for females and 19 years for males, though physical maturity is not reached until age 25-30 for females and 45-60 for males. Breeding occurs every 3-5 years, and after a gestation period of 14-15 months a single calf is born. The polygamous nature of sperm whales allows a regulated harvest while keeping stocks above maximum yield levels. The population have responded well to regulated harvest. Preferred food items off the coast of British Columbia and California are large squid, octupus, and deepwater fishes.

The black right whale (Balaena glacialis) is an extremely rare baleen whale inhabiting temperate waters throughout the world. The eastern North Pacific population migrates between the summering grounds

from Bristol Bay and the Gulf of Alaska to 50°N latitude and the wintering grounds from Oregon to central Baja California (Eaton 1975). Only 250 remain in the North Pacific. Little is known about the reproductive biology of right whales. Calves are born in winter after about a one year gestation period. Females bear every two or more years. Right whales feed mainly on copepods. Sightings offshore from Washington include 6 in 1958 and 3 in 1967.

The humpback whale (Megaptera novaeangliae) has been intensively hunted throughout its worldwide range resulting in severely depleted numbers. Only 850 individuals remain in the North Pacific population (Everitt, et al. 1979), which ranges from the Chukchi Sea south to southern California during summer and south to Jalisco, Mexico and the Hawaiian Islands during winter (Eaton 1975). Humpbacks migrate along the coast, and thus are sighted with some frequency along Washington. Humpback whales could occur anywhere in the inside waters of Washington, but the chance of more than a few stragglers occurring is slight (Tillman 1980). Sexual maturity is reached at age 6-12 years. Mating and calving occur October to March, and after a gestation period of about one year a single calf is born. Females rarely give birth in successive years. Humpback whales feed mainly on euphausiids and occasionally anchovies and sardines during summer and fast during winter. Humpack whales are second to the right whale in rarity.

The blue whale (Balaenoptera musculus) is the largest species of mammal and is distributed throughout the world (Eaton 1975). The North Pacific population numbering 1500, migrates in summer from central California to the Aleutian Islands and the Gulf of Alaska, and in winter migrates from central Baja California to southern Sinaloa, Mexico. Blue whales frequent waters seaward from the continental slope, and have not been sighted in coastal waters. Sexual maturity is reached around 10 years. The female mates every 2-3 years in the winter and after a gestation period of 12 months, gives birth to a single calf. Blue whales feed exclusively on euphausiids during the summer, and fast in the winter.

3.9.2 Impacts on Whales

Because the threatened and endangered species of whales that occur in Washington waters are generally rare or accidental, whales are not likely to be adversely affected by construction or operation of the NTPS. The gray whale is the only species considered common, and its occurrence is primarily related to migration. Gray whales and other whales are likely to avoid the construction areas for the submarine pipelines. The construction periods for Ediz Hook to Green Point, Port Williams to Partridge Point and Polnell Point to Browns Point submarine pipelines may last as long as 90, 70 and 70 days, respectively. During this period the whole submarine pipeline route will not be disturbed simultaneously. Generally, the pipelaying activities will be dispersed over a 7,000 foot distance and will move about 1,000 to 2,000 feet per day. Thus, whales should be able to pass around the operations but will likely avoid the immediate area of pipelaying activities.

Operational impacts on whales would be primarily associated with potential oil spills. Vessel casualties could affect large portions of the Strait of Juan de Fuca or Puget Sound if oil spill containment and clean-up procedures fail. Whales are smooth skinned and are not easily oiled. Whales are also intelligent and are believed to avoid obvious concentrations of oil (Nelson-Smith 1972). After the Santa Barbara oil spill, no adverse impacts to whales relating to oil contamination were documented (Brownell 1971). It has been postulated that cetaceans exposed to oil could experience absorption of oil through the mucous membrane lining the blow hole beyond the nasal plug. Through time a thin film of oil could cover much of the lungs and respiratory passages (U.S. Department of Interior 1975). The result could include inhibition of oxygen exchange, disruption of normal diving behavior, weakening of the animal, and potentially pneumonia and death (USDI 1975). The low probability of oil spills in the Strait of Juan de Fuca, combined with their limited presence, indicate that whales are not likely to be impacted.

3.9.3 Alternative Actions and Conservation Measures

No procedures are proposed because of the low numbers and low likelihood of impact.

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3.10 Plants

3.10.1 Introduction

The legal status of rare plant species along the proposed pipeline route is unclear. Currently no plant species are on the list of federally threatened and endangered species. Numerous species will be on the candidate list, which is expected to be published around August 15, 1980. The seven species treated in this assessment are those that, in the opinion of several experts, will be proposed for threatened or endangered status within the near future (Table 3.10-1). Very little information is available on most of these species; habitat and phenological characteristics are based on available literature.

3.10.2 Grindelia howellii

Howell's gumweed (Grindelia howellii) is a composite growing in grassy openings in forested areas (Watson no date). The distribution includes Kootenai County, Idaho, and western Montana in the foothills of the Swan Range in Powell and Missoula Counties. Howell's gumweed is an early successional plant usually associated with disturbed sites in coniferous forests and overgrazed fields at 3800-4400 feet. It grows best on level ground in rocky, granitic clays under full sunlight. Associated species include Pseudotsuga menziesii, Larix occidentalis, Pinus ponderosa, Achillea millefolium, Agropyron caninum, Potentilla gracilis, and Melolitus alba. Flowering occurs from mid-July to late August, and fruiting occurs in September. Eight populations averaging 5-60 plants each have been located in Montana and one population occurs in Idaho (Watson 1980). The Montana populations are all sustaining damage from human activities such as road-grading, spraying, and grazing operatons.

3.10.3 Polemonium pectinatum

Washington Polemonium (Polemonium pectinatum) is a phlox with large white to cream-colored flowers growing in moist bottomlands from 600-900 m in elevation (Kennison and Taylor 1979). Six populations have been recorded in Whitman, Spokane, Lincoln, and Adams Counties in eastern Washington. These habitats have been converted to agriculture and the present distribution is unknown; thus the species may be extinct.

TABLE 3.10-1

THREATENED AND ENDANGERED PLANTS

	Habitat	Time of Flowering	Locations	Comments
Trisetum orthochaetum (Watson 1980) (Hitchcock 1971)	boggy meadow		Missoula Co., MT below Hot Springs	probably extinct only one individual, a sterile hybrid
Grindelia howellii "gumweed" (Watson 1980, 1973) (Hitchcock 1971)	grassy opening in forested area	mid-July--late August	Powell & Missoula Cos., MT Clearwater Junction	8 population
			Kootenai Co., ID St. Mary's River	1 population
Silene speldingii "spalding's silene" (Hitchcock 1971)	sagebrush, scablane ponderosa pine forest	June-July	Flathead Co., MT; Idaho Co., ID; Spokane Co., WA	
Penstemon lemhiensis (Gale 1980) (Hitchcock 1971)	grassland, open ponderosa pine forests, cutbanks sagebrush	June-July	N. Lemhi Co., ID S. Ravalli Co., Beaverhead Co., Big Hole area	depends on one species of wasp for pollination. 7 sites in MT, less than 400 plants total.
Aster curtus "whitetop aster" (WNHP 1980)	prairies		Island Co., WA T17N, R01W, S31	
Polemonium pectinatum "Washington polemonium" (Kennison and Taylor 1979)	moist bottom-lands	May-July	Spokane Co., WA	
Astragalus misellus var. pauper "Pauper milkvetch" (Kennison and Taylor 1979) (WNHD 1980)	rocky slopes, sagebrush steppe	April-June	Kittitas Co., WA T19N, R21E., S13 T19N, R22E., S18	

Flowering occurs May to July, and pollinators probably include Lepidopterans, Nymenopterans, and Dipterans. Seeds fall close to the parent with no specialized adaptation for dispersal.

3.10.4 Astragalus misselus var. pauper

The pauper milkvetch (Astragalus misellus var. pauper) is a legume with racemes of small greenish-yellow flowers (Kennison & Taylor 1979). The variety pauper has just recently been recognized as a distinct variety, and is very similar to A. M. var. micellus. The taxon has only been reported from Kittitas County, Washington, and at present is known to occur only along Brushy Road in Kittitas County. Habitat includes sagebrush steepe at about 860 meters elevation, and may include such species as Artemisia tridentata, Agropyron spicatum, Festuca idahoensis, Poa sandbergii, Eriogonum sp. Erigeron sp. Flowering probably occurs April to early June, and pollinators are predominantly bumble bees. Seeds fall close to the parent with no specialized adaptation for dispersal. Agricultural development and overgrazing threatens the habitat of the taxon. Critical habitat has been proposed to include the location of the only known population.

3.10.5 Impacts on Plants

Currently the plants in Table 3.10-1 are known to occur in very few limited areas. If these plants occurred within the 90-foot construction rights-of-way they would be destroyed during clearing. If these plants were the only remnant population remaining of the species, extinction would occur.

3.10.6 Proposed Alternative Actions and Conservation Measures

When the candidate list of threatened and endangered plant species is published in late 1980, an assessment of the potential occurrence of these species along the route should be done. Based on this assessment, the pipeline rights-of-way should be inspected during the appropriate season (flowering) to confirm their presence or absence. Only likely habitats, based on existing observations, should be searched. If populations of threatened and/or endangered plants are found, the 90-foot rights-of-way would be altered to miss these areas or otherwise mitigated

depending on U.S. Fish and Wildlife recommendations. If this is not possible, Northern Tier should consult with U.S. Fish and Wildlife to determine alternative actions.

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Kennison, J. A. and R. J. Taylor. 1979. Status report for Astragalus misellus var. pauper. Unpublished report. Available from U.S. Fish and Wildlife Service, Office of Endangered Species, Boise, Idaho.

Watson, T. J., Jr. 197__ (undated, between 1977-1980). Status report for Grindelia howellii. Unpublished report. Available from U.S. Fish and Wildlife Service, Office of Endangered Species, Denver, Colorado.

Watson, T. J., Jr. 1980. Professor and Graduate Assistant, University of Washington. Telephone conversation with J. S. Armbruster, Wildlife Biologist, Environmental Research & Technology, Inc., concerning threatened and endangered plants in Montana. June 4.

4.0 SUMMARY

In conclusion, several threatened and/or endangered species occur along the proposed Northern Tier Pipeline System. Several species, including the sea turtles, whales, and brown pelican are rare visitors to Washington's inland waters and probably will not be affected. Other species like the grizzly bear and gray wolf occur near the route but their ecological requirements preclude their use of the areas along the pipeline due to existing disturbance.

The whooping crane and black-footed ferret could potentially be affected by the construction and operation of the pipeline, that is, whooping cranes and black-footed ferrets may occur along the line but mitigation measures will reduce the likelihood of a loss of individuals or a population. Although their habitat exists along the pipeline, historical sightings indicate that their presence is very unlikely. In Montana, most of the historical sightings of ferrets occur in southeastern Montana, in counties not crossed by the pipeline. In North Dakota, all sightings of ferrets occur west of the Missouri River in counties not crossed by the NTPS. The pipeline crosses through the whooping crane migration route in North Dakota. The wetland habitats used by whooping cranes during migration will not be significantly impacted by construction of the pipeline. Wetlands could be adversely impacted by a major oil spill. But since the whooping crane does not depend on one site during migration, and migration is limited to a couple of months each year, the potential for adverse impact is very low.

The species which could be impacted significantly by the NTPS are the peregrine falcon and bald eagle. "Significantly impacted" means that these animals may be impacted in such a way as to reduce numbers of individuals or populations. The peregrine falcon nests and winters near the proposed pipeline route in Washington. Construction activities occurring during the breeding season could result in nest abandonment and reproductive failure for nesting peregrines. Peregrine falcon eyries are suspected in only one area along the pipeline route. Conservation measures to limit construction to one-half mile away from the nests during the breeding season should eliminate impacts resulting from construction activities.

Peregrine falcons could be affected by a catastrophic oil spill. Peregrines are dependent on waterfowl and shorebirds for food, especially during the breeding season. If an oil spill eliminated this important prey base, peregrine falcon numbers would decline. The likelihood of a major oil spill occurring as a result of the NTPS is once in 27 years. The current risk of oil spills to these resources is once in 32 years. Conservation measures inherent in the design of the NTPS, such as the Oil Spill Contingency Plan, will help reduce the potential impact to all resources including the peregrine falcon and the bald eagle. Because of the low probability of an oil spill during the life of the project, the peregrine falcon and bald eagle should not be affected by oil spills.

Bald eagles could be affected by construction of the NTPS through disturbance and loss of habitat at Green Point and disturbance at Polnell Point. An active eagle nest at Polnell Point could be abandoned during submarine pipeline construction. However, the proposed conservation measures, no construction from February 1 to July 31 within one-half mile of the nest, should provide adequate protection. The nest tree at Green Point has not been successful in the last three years, and the only record of use occurred in early 1979. The importance of the nest tree is difficult to evaluate because of the existing disturbance of the habitat by housing development and selective timber harvest. The recommended conservation measures, which parallel U.S. Fish and Wildlife Service guidelines, should provide an adequate vegetative buffer and should reduce disturbance during the breeding season. Wintering eagles as well as breeding eagles could be significantly affected by a large oil spill eliminating a food source, however the probability of such an event is very low.

APPENDIX A

Information Request Letters Listing

Experts Contacted

April 10, 1980
Ref. No. P5344

//*//
//*//
//*//
//*//
//*//
//*//
//*//

Dear //*//,

Environmental Research & Technology, Inc. has been contracted by Northern Tier Pipeline Company to work with the U.S. Bureau of Land Management and the U.S. Fish and Wildlife Service in completing the biological assessment of endangered species potentially occurring along the proposed pipeline route. This evaluation is required under the Endangered Species Act of 1973 (Figure 1). A list of potentially affected species has been identified by the U.S. Bureau of Land Management and includes:

Mammals:	
Gray wolf	Canis lupus
Grizzly bear	Ursus arctos horribilis
Black-footed ferret	Mustela nigripes
Birds:	
Whooping crane	Grus americana
Bald eagle	Haliaeetus leucocephalus
American peregrine falcon	Falco peregrinus anatum
Arctic peregrine falcon	Falco peregrinus tundrius
Brown Pelican	Pelecanus occidentalis
Whales:	
Gray whale	Eschrichtius gibbosus
Humpback whale	Megaptera novaeangliae
Finback whale	Balaenoptera physalus
Blue whale	Balaenoptera musculus
Sei whale	Balaenoptera borealis
Sperm whale	Physeter catodon
Right whale	Eubalaena spp. (all)
Sea Turtles:	
Leatherback sea turtle	Dermochelys coriacea
Green sea turtle	Chelonia mydas

Plants:

Erythronium oregonum
Arnica amplexicaulis var. piperi
Astragalus misellus
Erigonium thymoides
Hydrophyllum capitatum var. thompsonii
Lomatium laevigatum
Erigeron piperianus
Haplopappus liatriformis
Polemonium pectinatum
Cardamine canstancei

Our study will include onsite inspections, interviews with recognized experts, and review of published and unpublished literature. After interpretation of data, an analysis of the potential effects on endangered species and possible alternative actions will be completed. Information regarding the Northern Tier proposal is available in the Bureau of Land Management's Final Environmental Impact Statement: Crude Oil Transportation Systems released in 1979 and available in all government depository libraries or from the Bureau of Land Management, Energy Rights-of-Way Transportation and Compliance Staff, Billings, Montana.

As such we wish to solicit from you and your agency any information concerning the occurrence, distribution and abundance of the federally endangered species listed above. Figure 2 illustrates the distribution of endangered species potentially occurring along the proposed route based on information available to date. We would be interested in unpublished data, reports, and studies as well as any published studies dealing with the life history of these species in the state of //*//. A list of state or regional experts for these species, and their addresses or affiliation would also be appreciated.

Environmental Research and Technology, Inc. will reimburse you for any publication costs incurred by you for photocopying or purchase of materials. We would prefer to retain our own copies of your information, but we will promptly return any materials submitted to us "on loan". Please submit your information as soon as possible; the Bureau of Land Management has only 180 days to complete the entire review process. If you have any comments or questions concerning this study please feel free to contact me, Judy Scherpelz or Tom Shoemaker at 303-493-8878.

Your cooperation and input are essential to the completion of an accurate and fair biological assessment of this proposal and its effects on endangered species.

Thank you, in advance, for your time and prompt attention.

Sincerely yours,
ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

Germaine Reyes-French
Assistant Project Manager,
Ecology and Water Quality Programs
Northern Tier Pipeline Project

GR/gc

Enc.

cc: Tom Shoemaker
Judy Scherpelz
Lanny Reed
Gary Gebhart

Wynn Freeman
Fish and Game Building
1420 E. 6th Avenue
Helena, MT 59601

ATTN: Nongame Wildlife Specialist
Washington Department of Game
600 N. Capitol Way
Olympia, WA 98504

Russell W. Stuart
Game and Fish Department
2121 Lovett Avenue
Bismarck, ND 50505

David B. Vesall
Division of Fish and Wildlife
Dept. of Natural Resources
300 Centennial Office Bldg.
Box 33
658 Cedar Street
St. Paul, Minnesota 55155

Roger Williams
Idaho Dept. of Fish and Game
600 S. Walnut Street
P.O. Box 25
Boise, ID 83707

U.S. Fish and Wildlife Service
North Central Region
Office of Endangered Species
Federal Building
Fort Snelling
Twin Cities, MN 55111

U.S. Fish and Wildlife Service
Denver Region
Office of Endangered Species
P.O. Box 25486
Denver Federal Center
Denver, CO 80225

U.S. Fish and Wildlife Service
Pacific Region
Office of Endangered Species
500 NE Multnomah Street
Portland, OR 97232

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.
BOX 2105, 1716 HEATH PARKWAY, FORT COLLINS, COLORADO 80522, (303) 493-8878

April 11, 1980

//2//
//3//
//4//
//5//
//6//

Dear Mr. //7//:

Environmental Research & Technology, Inc. has been contracted by Northern Tier Pipeline to work with federal and state agencies in completing the biological assessment of endangered species potentially occurring along the route. This evaluation is required under the Endangered Species Act of 1973 (Figure 1). A list of potentially affected species has been identified by the U.S. Bureau of Land Management and includes:

Mammals:	
Gray wolf	Canis lupus
Grizzly bear	Ursus arctos horribilis
Black-footed ferret	Mustela nigripes
Birds:	
Whooping crane	Grus americana
Bald eagle	Haliaeetus leucocephalus
American peregrine falcon	Falco peregrinus anatum
Arctic peregrine falcon	Falco peregrinus tundrius
Brown Pelican	Pelecanus occidentalis
Whales:	
Gray whale	Eschrichtius gibbosus
Humpback whale	Megaptera novaeangliae
Finback whale	Balaenoptera physalus
Blue whale	Balaenoptera musculus
Sei whale	Balaenoptera borealis
Sperm whale	Physeter catodon
Right whale	Eubalaena spp. (all)
Sea Turtles:	
Leatherback sea turtle	Dermochelys coriacea
Green sea turtle	Chelonia mydas

FRMLTR/S1

Plants:

Erythronium oregonum
Arnica amplexicaulis var. piperi
Astragalus misellus
Erigonium thymoides
Hydrophyllum capitatum var. thompsonii
Lomatium laevigatum
Erigeron piperianus
Haploppus liatriformis
Polemonium pectinatum
Cardamine constancei

Our study will include onsite inspections, interviews with recognized experts, and review of published and unpublished literature. After interpretation of data, an analysis of the potential effects on endangered species and possible alternative actions will be completed. Information regarding the Northern Tier proposal is available in the Bureau of Land Management's Final Environmental Impact Statement: Crude Oil Transportation Systems released in 1979 and available in all government depository libraries or from the Bureau of Land Management, Energy Rights-of-Way Transportation and Compliance Staff, Billings, Montana.

Mr. //*// of //*// recommended you as a //*// expert. As such we wish to solicit from you any information concerning the occurrence, distribution and abundance of //*// in the state of //*//. Figure 2 illustrates the distribution of endangered species potentially occurring along the proposed route. The attached blueline maps depict the proposed Northern Tier pipeline route. Please review these maps and inform us to any conflicts between the //*// and the proposed route. We would appreciate hearing from you as soon as possible. If you have additional questions please feel free to contact me, Judy Scherpelz or Tom Shoemaker at 303-493-8878.

ERT

Your cooperation and input are essential to the completion of an accurate and fair biological assessment of this proposal and its affects on endangered species.

Thank you in advance for your time and prompt attention.

Sincerely yours,
ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

Germaine Reyes-French
Assistant Project Manager,
Ecology and Water Quality Programs
Northern Tier Pipeline Project

GR/gc

Enc.

ERT

Charles Jonkel
Department of Forestry
University of Montana
Misoula, MT 59812

James Mattsson
U.S. Fish and Wildlife Service
Box 845
Bemidjii, MN 56601

Al Groves
National Marine Fisheries Service
Seattle, WA

Rick Knight
Nongame Department
Washington Department of Game
600 N. Capitol Way
Olympia, WA 98504

Jim Nelson
Bismarck Area Office
U.S. Fish and Wildlife Service
P.O. Box 1896
Bismarck, ND 58501

Morrey Sanderson
Pierre Area Office
U.S. Fish and Wildlife Service
P.O. Box 250
Pierre, SD 57501

Jay Sumner
Arlee, MT 59821

Tim Clark
P.O. Box 2705
Jackson, Wyoming

Conrad Hillman
c/o Rocky Mountain Forest and
Range Experiment Station
Rapid City, SD 57701

Jay Gore
Division of Ecological Services
U.S. Fish and Wildlife Service
4620 Overland Road
Boise, ID 83707

Bob Ream
Wolf Ecology Project
Wilderness Institute
University of Montana
Missoula, MT 59812

Dennis Flath
Montana Department of Fish and Game
RR3
Bozeman, MT 59715

Chris Servheen
Department of Forestry
Unviersity of Montana
Missoula, MT 59812

Jim Engle
U.S. Fish and Wildlife Service
Office of Endangered Species
Federal Building Fort Snelling
Twin Cities, MN 55111

APPENDIX B

Responses to Information Requests

STATE OF WASHINGTON
Department of
Natural Resources

COMMISSIONER
BERT L. COLE

R. A. BESWICK
SUPERVISOR

OLYMPIA, WASHINGTON
98504

-0000-

April 10, 1980

MEMORANDUM

TO: Those Concerned with Rare, Endangered and Threatened Plants in the State of Washington

FROM: Department of Natural Resources, Olympia, Washington

SUBJECT: Revised "Working List" of Rare Plants

We are sending the enclosed "Revised Working List of Rare, Endangered and Threatened Vascular Plants in Washington" to selected individuals or organizations with related expertise and concern.

We would appreciate your careful review of: (1) The 376 species on the revised list; (2) those 46 species deleted from the 1978 working list that are named in Appendix I and II; and, (3) those 72 species added to the 1978 working list that are named in Appendix III.

Any comments you may have concerning the revised list or the additions or deletions should be sent to the Washington Natural Heritage Program at the address given on the title page of the listing by September 1, 1980.

Later during the fall of this year or early in 1981, the Department will adopt an official State list of rare, endangered and threatened plants. That list will be submitted to the U.S. Fish and Wildlife Service that administers the Federal Endangered Species Act.

AO:em

Enclosures

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:
AFF-SE

APR 18 1980

Ms. Germaine Reyes-French
Environmental Research & Technology, Inc
Box 2105, 1716 Heath Parkway
Fort Collins, Colorado 80522

Dear Ms. Reyes-French:

The three species of concern in the Minnesota portion of the Northern Tier Pipeline are:

Gray Wolf (T)	Canis lupus
Bald Eagle (T)	Haliaeetus leucocephalus
Peregrine Falcon (E)	Falco peregrinus

In January 1980 I met with Mr. Bruce Garlepo of your company and discussed the possible effects of the pipeline on the above listed species. At that time, I gave Mr. Garlepo all the publications and bibliographical materials we had available. If there is a specific question or problem you have on one of the listed species in Minnesota, please contact the Region 3 Endangered Species Office at 612-725-3596.

Sincerely yours,

Jack W. West

Jack W. West
Acting Assistant
Regional Director

STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
CENTENNIAL OFFICE BUILDING · ST. PAUL, MINNESOTA · 55155

April 24, 1980

DNR INFORMATION
(612) 296-6157

Germaine Reyes-French
Assistant Project Manager
Ecology and Water Quality Programs
Northern Tier Pipeline Project
Box 2105, 1716 Heath Parkway
Fort Collins, Colorado 80522

Dear Ms. Reyes-French:

Thank you for your letter of April 10, 1980, regarding endangered species. The only four species which must be addressed in the Minnesota portion of your endangered species assessment: gray (timber) wolf, whooping crane, arctic peregrine falcon, and bald eagle. The whooping crane and arctic peregrine falcon are migrants and no detrimental impacts are anticipated.

As you can see in the enclosed timber wolf management plan, the estimated wolf density in the eastern half of your proposed corridor in this state is only 1 wolf per 100 square miles. This is on the periphery of wolf range, and the proposed project is therefore not felt to have any adverse impact on this species.

Two records of bald eagle nests exist for the northern half of Clearwater County. One nest, in the NW¼ of Section 7, Township 148, Range 38 (about 7 miles west-southwest of Clearbrook) blew down in 1978 and no longer exists. Another nest exists in Township 152, Range 37 (about 20 miles north of Clearbrook). The pipeline is, therefore, not felt to create any potential problems for the welfare of the bald eagles.

When you have a more defined corridor, I would appreciate receiving a map to help insure that no prairie chicken booming grounds or sandhill crane nesting areas are on the route.

Sincerely,

Carrol L. Henderson

CARROL L. HENDERSON
Nongame Supervisor
Section of Wildlife

CLH:pmt

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

National Marine Mammal Laboratory, NWAFC
7600 Sand Point Way NE, Bldg. 32
Seattle, Washington 98115

April 25, 1980 F/NWC3:CHF

Mr. Germaine Reyes-French
Assistant Project Manager
Ecology and Water Quality Programs
Northern Tier Pipeline Project ERT
Box 2105
Fort Collins, Colorado 80522

Dear Mr. Reyes-French:

Enclosed is the information you requested regarding endangered species likely to enter the Strait of San Juan de Fuca and northern Puget Sound in the area of the proposed pipeline.

The Green sea turtle, to the best of our knowledge, has not been reported north of California; however, you may wish to consult a recognized turtle authority re this species and the Leatherback for additional information.

Sincerely yours,

Michael F. Tillman

Michael F. Tillman, Ph.D.
Director, National
Marine Mammal Laboratory

Enclosure

United States Department of the Interior
FISH AND WILDLIFE SERVICE
AREA OFFICE: SOUTH DAKOTA—NEBRASKA
POST OFFICE BOX 250
PIERRE, SOUTH DAKOTA 57501

IN REPLY REFER TO:

April 29, 1980

Ms. Germaine Reyes-French
Assistant Project Leader
Northern Tier Pipeline Project
Environmental Research Technology, Inc.
1716 Heath Parkway, Box 2105
Fort Collins, Colorado 80522

Dear Ms. Reyes-French:

The following information is in response to your letter of April 11, 1980. Whooping crane sightings in Montana are most frequently associated with the U.S. Fish and Wildlife Service, Medicine Lake National Wildlife Refuge, and the area along the eastern boundary of Montana; these birds are part of the Wood Buffalo National Park (Canada) flock. Individual whoopers of the Gray's Lake, Idaho, experimental flock have been reported to spend some time in Montana; you might contact Dr. Rod Drewien; Gray's Lake National Wildlife Refuge; P.O. Box 837; Soda Springs, Idaho 83276; regarding these reports and locations.

Whooping cranes may occur at most any location along the pipeline route across North Dakota. Sightings have been reported from one border to the other.

Historical nesting records are as follows: North Dakota - (1) Rolette County, 1871; (2) Nelson County, until 1908; Minnesota - (1) Morrison County, 1874; (2) Grant County, 1876; (3) Marshall County, 1889.

Migration sightings will occur in the vicinity of the pipeline route. Sighting records are attached for Montana and North Dakota. These records have been accumulated during monitoring conducted by the U.S. Fish and Wildlife Service since 1975.

Major concerns of the pipeline project and whooping cranes would focus on the potential for wetland drainage as bottom seals are penetrated during pipeline burial or via other means and oil spills that may occur in wetland basins or drainages. Destruction of habitat and direct oil spill impact upon the whoopers during migration could occur.

If you have additional questions, please contact Maurice Anderson of this office.

Sincerely yours,

James W. Salyer

James W. Salyer
Area Manager

Attachments

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME
Research Bureau
Box 5 - MSU Campus
Bozeman, MT 59717

April 30, 1980

Germaine Reyes-French
Environmental Research &
Technology, Inc.
Box 2105, 1716 Heath Parkway
Fort Collins, CO 80522

Dear Ms. Reyes-French:

This letter responds to your request for information on the black-footed ferret, gray wolf and bald eagle along the Northern Tier Pipeline route in the state of Montana.

The route does not pass through any habitat which has been judged essential to conservation or recovery of the gray wolf.

There are no known bald eagle nesting sites along the proposed route, but most major waterways are used by migrant or wintering bald eagles. The segments from MP 460 to MP 500, and from MP 550 to MP 567 could affect wintering bald eagles if an oil spill were to occur.

The black-footed ferret is suspected to occur within the area from MP 760 to MP 960. Ferrets are only known to occur on prairie dog towns, so it will be necessary to survey any prairie dog towns encountered along the route for evidence of ferret activity.

If ferret activity is identified, it may be necessary to alter the timing of construction or to alter the route slightly.

Additionally, there are many other potential wildlife impacts which should be considered. I have, and will continue, to work with the BLM staff in Billings on this matter. Information contained here refers only to those three species for which you requested information. If you desire, I could also provide you with information on other species.

Sincerely,

Dennis L. Flath

Dennis L. Flath
Nongame Biologist

DLF/ble

United States Department of the Interior
FISH AND WILDLIFE SERVICE
AREA OFFICE—NORTH DAKOTA
1500 CAPITOL AVENUE
P.O. BOX 1897
BISMARCK, NORTH DAKOTA 58501

MAY 5 1980

Ms. Germaine Reyes-French
Assistant Project Manager
Environmental Research and Technology, Inc.
Box 2105, 1716 Heath Parkway
Ft. Collins, Colorado 80522

Dear Ms. Reyes-French:

This responds to your letter of April 10, 1980, related to threatened and endangered species in the North Dakota section of the Northern Tier Pipeline route.

The species distribution map appears to be complete except that bald eagles are found in North Dakota. In the portion of the state affected by the pipeline, they occur only in a migratory or transient status. The same applies, in North Dakota, to whooping cranes and peregrine falcons. There are no prairie dog towns in the northern part of the state; therefore, the occurrence of black-footed ferrets is remote.

We have little to suggest in the way of studies or reports relative to these species in North Dakota. I am enclosing a listing of whooping crane sightings within North Dakota. Several are in the general area of the proposed pipeline. Unfortunately, we don't have similar information for the other species.

Sincerely yours,

Belva Hochhalter

for James L. Nelson
Wildlife Biologist

Enclosure

School of Forestry

University of Montana
Missoula, Montana 59812

7 May 1980

Ms. Germaine Reyes-French, Assistant Project Manager
Ecology and Water Quality Programs
Northern Tier Pipeline Project
ERT
Box 2105
1716 Heath Parkway
Ft. Collins, CO 80522

Dear Ms. Reyes-French:

Thank you for the opportunity to review the proposed Northern Tier Pipeline route in regards to the grizzly bear. I find no areas of direct conflict with the proposed routing of the pipeline and the habitat of the grizzly in northwest Montana. The route shown on the blueline map skirts most permanently occupied habitat. I am concerned with the possibility of the pipeline extending across the Flathead Indian Reservation and proceeding through the Jocko River drainage and the Placid Creek drainage on the Lolo National Forest. This route was not shown on the blueline maps, but it has been discussed in local newspaper accounts. If this route is a possibility, I would like the opportunity to review the maps of the route as it does cross grizzly habitat.

Thank you.

Sincerely,

Christopher Servheen
Research Biologist

kk

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:
AFF-SE

MAY 15 1980

Ms. Germaine Reyes-French
Assistant Project Manager
Ecology & Water Quality Programs
Environmental Research & Technology, Inc
Box 2105, 1716 Heath Parkway
Fort Collins, Colorado 80522

Dear Ms. Reyes-French:

I am responding to your letter of inquiry to Mr. James Mattsson, U. S. Fish and Wildlife Service, Bemidji, Minnesota. Mr. Mattsson is on another assignment and not in a position to respond at this time. There is an active eagle nest in Clearwater County between Pine and Pike Lakes approximately 2 miles SW of the proposed pipeline route. At present, we are suggesting a 1/2 mile radius limited activity buffer zone around all active eagle nests during the nesting and fledging season. This nest should not be disturbed by pipeline construction if the proposed route as described on your map is followed. If, however, the route is moved to the south a potential problem could evolve.

In talking to Mr. Mattsson, he informed me that no other eagle nests occur along the proposed pipeline route.

Sincerely yours,

Daniel H. Bumgarner

Daniel H. Bumgarner
Assistant Regional Director

MAY 29 1980

STATE OF WASHINGTON
DEPARTMENT OF GAME

cc: Governor
Gene
Bennett
Curtis
Berry

Memo for

GARY:

Enclosed is a copy of a letter I sent to Rick Knight outlining my position on Department recommendations for your storage facility site.

I believe that these recommendations should coincide with Northern Tier's proposals for the site.

Please let me know if I can help any more with this at present.

George Allen

MAY 29 1980

STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF GAME
600 North Capitol Way, GJ-11 Olympia, WA 98504 206/753-5700

28 May 1980

R. L. Knight, Coordinator, Washington Eagle Study
Nongame Program, Washington Department of Game
600 North Capitol Way
Olympia, Washington 98504

Dear Rick:

As you may recall, our field team recently visited the proposed site of the Northern Tier Pipeline storage facility near Port Angeles to measure vegetation and disturbance parameters at the site. This nest was reportedly built in the late 1970's, but was blown from the nest tree in early 1979. While the nest has not been rebuilt, I feel that this site should be protected as outlined in the federal bald eagle management guidelines. This recommendation is based on the following information and observations:

1) Although presently unused, the fact that this nest was built very recently indicates that the surrounding area meets at least some of the requirements for nesting.

2) During the time that we were making measurements at the site two adult bald eagles(a probable pair) flew overhead and vocalized in a manner which indicated a defensive attitude toward the site.

3) Prey remains we collected below the snag just north of the nest tree indicate that the snag has been used this season for perching and eating.

It seems likely that one or more alternates to this nest are in the area, and as our study progresses I believe we should try to locate these sites and to find the areas that are being used by bald eagles in the vicinity of the proposed tank farm and pipeline. More detailed management recommendations for the area could follow such an investigation.

At present the Department of Game should recommend application of the federal management guidelines to the Northern Tier storage facility site. I would also recommend that the beginning of the period of restricted activity within the secondary zone around the nest be extended from 1 February to 1 January, as recommended by the Fish and Wildlife Service.

I suggest that your recommendations for this site be sent to

Gary Smith in the Northern Tier Information Office, at the address shown below. Please let me know of any further action I may take in this matter at present.

Sincerely,

George Allen

George Allen
Research Assistant, Washington
Eagle Study

cc: C. Rieck
Gary Smith
Northern Tier Information Office
220 West First
Port Angeles, Washington 98362

STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF GAME
600 North Capitol Way, GJ-11 Olympia, WA 98504 206/753-5700

May 30, 1980

Mr. Lanny Reed
Environmental Research and Technology
P.O. Box 2105
Fort Collins, Colorado 80522

Dear Mr. Reed:

In response to our May 28 conversation, I have checked our records for information on the threatened and endangered species you mentioned. Falco peregrinus anatum and F. peregrinus pealei are known to occur along the pipeline route during both summer and winter. The proposed corridor runs through the Skagit flats, an area of great importance as a peregrine falcon wintering area. In addition, there are suitable sites near the pipeline corridor for peregrine falcon eyries. There is evidence that these sites were at one time active peregrine falcon eyries. Individuals of F. peregrinus tundrius occasionally pass through Washington State during migration. All specific peregrine falcon information must be obtained through Nongame Biologist Fred Dobler and is only released when the birds are actually threatened.

Reports of Gray Wolves (Canis lupus) within the state are, for the most part, unverified. Fairly recent reliable reports indicate that the north central part of the state (Okanogan, Ferry, and Douglas Counties) supports a small number of Gray Wolves. One Gray Wolf was illegally collected in Douglas County in 1975.

For Grizzly Bear (Ursus arctos harribilis) we have no data to indicate its presence along the pipeline route in recent years. Grizzly Bear reports over the last two decades have been confined largely to the Selkirk Mountains in Pend Oreille and Stevens Counties and in the extreme northern Cascades.

The Brown Pelican (Pelecanus occidentalis) has been reported from the northwest tip of the state. Two were observed 2 miles north of Tatoosh Island in August, 1976 (see Seattle Audubon Notes, September 1976). Two more were seen and photographed at Neah Bay in August 1975 (Seattle Audubon Notes, October 1975). Tanker routes will likely pass through areas used by these occasional visitors.

In addition to the species mentioned here, many species of concern in Washington State may be impacted by the pipeline. Data will be presented at Northern Tier's hearings in this state.

Also, the Washington Natural Heritage Program has compiled information on endangered and threatened plants along the corridor. Contact Annette Olson at (206) 753-2448 to ask about receiving a copy of this report.

I hope this information meets your needs. The Washington Natural Heritage Data System receives information regularly. The data in storage at this time is far from complete.

As you can tell from this letter, we have a very limited amount of information on the species you mentioned. The peregrine falcon is the most intensely studied species among those mentioned and much of our information is considered confidential. But, even so, the information we do have is not enough to fully understand the bird's movements and other habits.

Our knowledge of threatened and endangered species, those federally listed and those threatened within the state, suffers due to an unfortunate lack of information.

Sincerely,

THE DEPARTMENT OF GAME

Kelly R. McAllister

Kelly R. McAllister
Research Assistant
Nongame Program

KRM:ba

THE NATURE CONSERVANCY

WASHINGTON NATURAL HERITAGE PROGRAM

3111 SEMINAR BUILDING (SE 3109)
THE EVERGREEN STATE COLLEGE
OLYMPIA, WASHINGTON 98505
206-753-2449

June 5, 1980

Judy Armbruster
Wildlife Biologist
ERT
1716 Heath Parkway
Fort Collins, CO 80522

Dear Ms. Armbruster:

Thank you for the opportunity to provide input to the biological assessments of species of concern occurring along the proposed Northern Tier Pipeline corridor.

Enclosed you will find copies of:

1) our February 2, 1979, response to BLM

2) our June 4, 1980, response to the Washington Department of Ecology

3) a plant species list published in the State EIS by the Washington Energy Facility Site Evaluation Council

4) The Revised Working List of Rare, Endangered and Threatened Vascular Plants in Washington.

Recent field studies in the State of Washington have been conducted by the Washington Natural Heritage Program and others. This work is expected to continue in the coming years. The information from these studies is incorporated in the Natural Heritage Data System and is available for use in both site-specific and master planning. If your office should conduct or contract for field surveys in the study area, please feel free to contact us for site specific information for use in field survey planning. In addition, it would be most helpful if you could provide us with the site-specific field data from any such studies for incorporation into the Data System.

If your office should publish or distribute any of the information presented here, please cite the Washington Natural Heritage Program, as follows:

> Washington Natural Heritage Program, 1980. Natural Heritage Data System. 3111 Seminar Building (SE 3109), The Evergreen State College, Olympia, WA 98505.

In order to ensure the protection of the special species and plant communities occurring in the study area, we recommend that the locational information presented here not be published or distributed. Finally, before distribution

please provide our program with a draft of any document in which information from the Natural Heritage Data System is incorporated or referenced.

I hope this presentation will be useful to you. More detailed locational information from our files can be made available for site planning purposes. If you have any further questions or concerns, please feel free to contact me at (206) 753-2449.

Sincerely,

Annette M. Olson

Annette M. Olson
Data Management Specialist

Enclosures

AM:sp

United States Department of the Interior
FISH AND WILDLIFE SERVICE

MAILING ADDRESS:
Post Office Box 25486
Denver Federal Center
Denver, Colorado 80225

STREET LOCATION:
134 Union Blvd.
Lakewood, Colorado 80228

IN REPLY REFER TO:
FA/SE/BLM - Northern Tier
Pipeline Company (6-1&2-79-F-1)

JUN 6 1980

Ms. Germaine Reyes-French
Assistant Project Manager
Ecology & Water Quality Programs
Northern Tier Pipeline Project
Environmental Research & Technology, Inc.
P.O. Box 2105
Fort Collins, Colorado 80522

Dear Ms. Reyes-French:

This responds to your April 10, 1980, letter requesting information concerning Federally listed endangered species occurring along the route of the proposed Northern Tier Pipeline.

Enclosed are lists of contacts and references to assist you in your analysis of the potential effects of the Northern Tier Pipeline on threatened and endangered species in Montana. A limited amount of information from our files is also included. For specific nesting data on the two endangered raptors, you will need to contact Dennis Flath and Chris Servheen for the bald eagle, and Dennis Flath and Jay Sumner for the peregrine. Their telephone numbers are listed in the attached list.

Due to the extensive amount of copying that would be required and the possibility of duplication of effort by other agencies supplying you with information, we have not included any copies of reports (see enclosed list). The need for these reports in our work also prevents us from sending them to you "on loan". Most should be obtainable from the authors or agencies responsible for the reports. You are also welcome to make use of the copies in our Billings Area Office.

Please contact Wayne Brewster, Endangered Species Team Leader in the FWS Billings Area Office, (406) 657-6059, if you need any further assistance.

Sincerely yours,

Sam Marler

Acting Regional Director

Enclosures

Species Contacts

Montana Portion of Northern Tier Pipeline

Name and Address	Species
Dr. Charles Jonkel Border Grizzly Project School of Forestry University of Montana Missoula, MT 59812 (406) 243-6523	grizzly bear
Chris Servheen Border Grizzly Project School of Forestry University of Montana Missoula, MT 59812 (406) 243-6523	grizzly bear, bald eagle
Jim Claar/Bob Klaver Flathead Agency Bureau of Indian Affairs Drawer A Ronan, MT 59864 (406) 676-4700	grizzly bear, bald eagle, peregrine falcon
Ken Greer Montana Department of Fish, Wildlife, & Parks Montana State University Bozeman, MT 59715 (406) 994-2660	grizzly bear
Steve Mealey Wildlife Biologist Arapahoe/Roosevelt National Forest Ft. Collins, CO 80521 (303) 482-5155	grizzly bear
Dr. John Craighead 5125 Orchard Lane Missoula, MT 59801 (406) 251-3944	grizzly bear, bald eagle, peregrine falcon
Don Brown Grizzly Bear Recovery Plan Leader Montana Department Fish, Wildlife, & Parks 1420 E. 6th Helena, MT 59601 (406) 449-2403	grizzly bear

Cliff Martinka Wildlife Biologist Glacier National Park West Glacier, MT 59936 (406) 888-5441	grizzly bear
B. Riley McClelland School of Forestry University of Montana Missoula, MT 59812 (406) 243-5675	bald eagle
Dr. Robert Ream Wolf Ecology Project School of Forestry University of Montana Missoula, MT 59812 (406) 243-5361	gray wolf
John Weaver Wildlife Biologist Bridger-Teton National Forest Forest Service Building Jackson, WY 83001 (307) 733-2752	gray wolf
Rod Drewien Idaho Cooperative Wildlife Research Unit University of Idaho Moscow, ID 83843 (208) 885-6111	whooping crane
Don Fortenberry Charles M. Russell National Wildlife Refuge P.O. Box 110 Lewistown, MT 59457 (406) 538-8706	black-footed ferret, bald eagle, and peregrine falcon (in CMR vicinity)
Con Hillman 4614 Staton Place Rapid City, SD 57701 (605) 343-6418	black-footed ferret
Max Schroeder Denver Wildlife Research Center Ft. Collins Field Station 1300 Blue Spruce Drive Ft. Collins, CO 80524 (303) 493-4855	black-footed ferret,

Maurice Anderson U.S. Fish and Wildlife Service 223 Federal Building P.O. Box 250 Pierre, SD 57501 (605) 224-8692	black-footed ferret, whooping crane
Jay Sumner P.O. Box 319 Arlee, MT 59821 (406) 726-3591 (home) or 3218 (work)	peregrine falcon
Jim Enderson Peregrine Recovery Team Member Department of Biology Colorado College Colorado Springs, CO 80903 (303) 473-2233, ext. 315	peregrine falcon
Bob Phillips USFWS Denver Wildlife Research Center Sheridan Field Station P.O. Box 916 Sheridan, WY 82801 (307) 672-5826 or 5927	bald eagle, peregrine falcon, black-footed ferret
Ray Linder Black-footed Ferret Recovery Team Leader South Dakota Cooperative Wildlife Research Unit Dept. of Wildlife & Fisheries Science South Dakota State University Brookings, SD 57006 (605) 688-6121	black-footed ferret
Lance Craighead address unknown (see John Craighead)	bald eagle
Vince Yannone Montana Dept. of Fish, Wildlife & Parks 1420 East 6th Avenue Helena, MT 59601 (406)449-3088	bald eagle (Missouri River)
Dennis Flath Montana Dept. of Fish, Wildlife, & Parks Research-Park Building P.O. Box 5-MSU Campus Bozeman, MT 59715 (406) 994-4241	bald eagle, peregrine falcon, gray wolf, black-footed ferret

Wayne Elliot
Bureau of Land Management
220 N. Alaska
Butte, MT 59701
(406) 763-2415

bald eagle
(Missouri River)

Tom Hinz/Jon Swenson
Montana Dept. of Fish, Wildlife, & Parks
P.O. Box 430
Miles City, MT 59301
(406) 232-4365

bald eagle
(eastern Montana)

List of References

Peregrine Falcon:

Enderson, James. 1978. Field report of falcon habitat on the Charles M. Russell National Wildlife Range, 22-24 May 1978. Unpub. Rep. 4 pp.

Enderson, James and Jerry Craig. 1973. Status of the peregrine falcon in the Rocky Mountains in 1973.

Haynam, Karen Craighead, and Jay S. Summer. 1977. Peregrine and prairie falcon nesting survey and habitat analysis - Lolo National Forest. Unpub.
Rep, Contract to USFS. 16 pp.

Snow, Carol. 1972. Habitat management series for endangered species, Report No. 1: American peregrine falcon and Arctic peregrine falcon. USDI, BLM, Tech. Note, 35 pp.

Peregrine Falcon Recovery Team. 1976. Peregrine Falcon Recovery Plan, Rocky Mountain/Southwest Population. USDI, FWS.

USDA, FS. 1978. Peregrine falcon essential habitat, Northern Region. 29 pp.

Whooping Crane:

USDI, FWS. 1978. Proposed critical habitat for the whooping crane. Federal Register, Vol. 43, No. 160.

Whooping Crane Recovery Team. 1980. Whooping crane recovery plan. USDI, FWS. 206 pp.

Black-footed Ferret:

Beck, David A., and James L. Gebhardt. 1978. Ecological requirements of the black-footed ferret. Pittman-Robert Projects, Study No. III, W-97-P, Jobs 1, 2, and 3. 23 pp.

Black-footed Ferret Recovery Team. 1978. Black-footed ferret recovery plan. USDI, FWS. 149 pp.

Fortenberry, Donald K. 1972. Characteristics of the black-footed ferret. USDI, FWS, Resource Pub. 109. 8 pp.

Hillman, Conrad N., Raymond L. Linder, and Robert B. Dahlgren. 19--. Prairie dog distribution in areas inhabited by black-footed ferrets. 9 pp.

Linder, Raymond L., and Conrad N. Hillman. 1973. Proceedings of the black-footed ferret and prairie dog workshop. South Dakota State Univ., Brookings. 205 pp.

Snow, Carol. 1972. Habitat management series for endangered species, Report No. 2: Black-footed ferret. USDI, BLM, Tech. Note. 23 pp.

USDA, FS. 1978. Black-footed ferret essential habitat, Northern Region.

Bald Eagle:

Lincer, Jeffrey L., William S. Clark, and Maurice W. LeFrance, Jr. 1979. Working bibliography of the bald eagle. Nat. Wildl. Fed., Sci. Tech. Ser. 2. 219 pp.

Meyers, James R. 1979. Northwest Montana/North Idaho transmission corridor bald eagle study. Bonneville Power Admin., Portland, Oregon. 90 pp.

Servheen, Christopher. 1978. The status of bald eagles in Montana. Raptor Research Foundation, Ann. meeting, Allentown, PA. 4 pp.

Snow Carol. 1973. Habitat management series for endangered species, Report No. 5 - Southern bald eagle and Northern bald eagle. USDI, BLM, Tech Note. 58 pp.

Spencer, Donald A. 1976. Wintering bald eagle. Nat. Agr. Chem. Assoc. Wa, D.C. 170 pp.

Steenhof, Karen. 1978. Management of wintering bald eagles. USDI, FWS, OBS. 59 pp.

U.S. Army C.O.E. 1979. The northern bald eagle (Haliaeetus leucocephalus), a literature survey. Environmental Resources Section, Seattle District, 85 pp.

USDA, FS. 1978. Bald eagle essential habitat, Northern Region.

USDA, FS. 1977. Bald eagle habitat management guidelines. California Region, 60 pp.

USDI, FWS. 1977. Bald eagle management guidelines, Oregon-Washington. 7 pp.

Flath, Dennis L. 1979. The nature and extent of reported wolf activity in Montana. 17 pp.

Mattson, Ursula, and Robert R. Ream. 1978. Current status of the gray wolf (Canis lupus) in the Rocky Mountain Front. Wolf Ecology Project, Univ. of Montana. 18 pp.

Northern Rocky Mountain Wolf Recovery Team. 1978. Draft plan for the recovery of the Northern Rocky Mountain Wolf.

Ream, Robert, and Gary Day. 1977. Northern Rocky Mountain Wolf. Results of studies on status and distribution of wolves in Montana. Wolf Ecology Project, Univ. of Montana, Missoula. 26 pp.

Ream, Robert R., and Ursula I. Mattson. 1979. Wolf status in the Northern Rockies. Wolf Ecology Project, Univ. of Montana, Missoula. 36 pp.

USDA, FS. Gray wolf essential habitat in the Northern Region.

Wolf Ecology Project. 1979. Annual Report, October 1978 to September 1979. 33 pp.

Grizzly Bears:

Border Grizzly Project. 1975-1980. (Numerous project reports, special reports, and working papers). Univ. of Montana, Missoula.

Erickson, Albert W. 1976. Grizzly bear management in the Thompson Falls area and adjacent environs. USDA, FS, Northern Region. 58 pp.

Mealey, Stephen P. 1977. Method for determining grizzly bear habitat quality and estimating consequences of impacts on grizzly habitat quality. USDA, FS, Northern Region. 36 pp.

Mealey, Stephen P., Charles J. Jonkel, and Ray Demarchi. 1977. Habitat criteria for grizzly bear management. Proc. 12th Conf. Game Biol. pp 276-287.

Servheen, Christopher, and Lyndon Lee. 1979. An assessment of the grizzly bear population size and a description of important grizzly use sites on the Finley Logging Unit, Flathead Reservation, Montana. Border Grizzly Project, Missoula. 63 pp.

Servheen, Christopher, and Lyndon Lee. 1979. Mission Mountain grizzly bear study. Border Grizzly Project, Missoula.

USDA, FS. 1975. Criteria for grizzly bear critical habitat identification. 18 pp.

USDA, FS. 1978. Grizzly bear essential habitat, Northern Region.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:
AFF-SE

JUN 10 1980

Ms. Judy Armbruster
1716 Heath Parkway
Fort Collins, Colorado 80522

Dear Ms. Armbruster:

As indicated in your telephone conversation with Tom Sheldrake on June 5, I have enclosed a list of Minnesota plants that are currently under review. We have a contract with the Minnesota DNR to determine the status of each of these plants in the state. If we may be of further assistance please write or call.

Sincerely yours,

Daniel H. Bumgarner

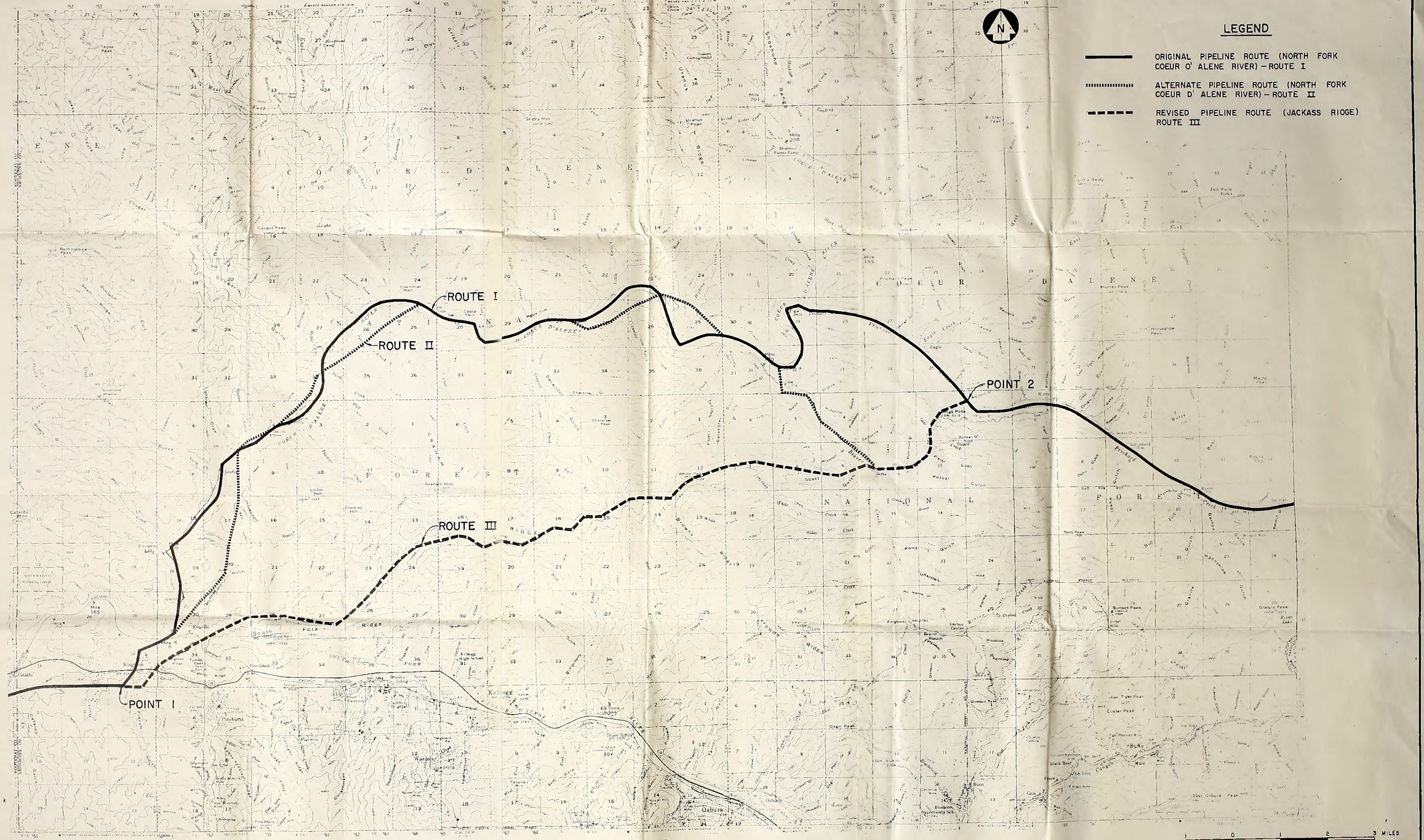
Daniel H. Bumgarner
Assistant Regional Director

Enclosure

Minnesota plants under review

Lespedeza leptostachya
Polemonium occidentale var. lacustre
Woodsia abbeae
Erigeron pulchellus var. tolsteadii
Erythronium propullans
Cypripedium arietinum
Listera auriculata
Platanthera leucophaea
Platanthera flava
Gymnocarpium heterosporum
Sullivantia ohionis
Sullivantia renifolia
Saxifraga forbesii
Panax quinquefolium
Cypripedium candidum


BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANTITOBA
ONTARIO
CANADA
PACIFIC OCEAN
WASHINGTON
OREGON
IDAHO
MONTANA
NORTH DAKOTA
MINNESOTA
PORT ANGELES
CLEARBROOK
Butler Associates, Inc.
Consulting Engineers Managers Tulsa, Oklahoma
NORTHERN TIER PIPELINE SYSTEM
PROPOSED PIPELINE ROUTE
DWN: C.M. DATE 4-13-78
CHKD: C.L.R. DATE 4-13-78
ENGR: D.R.W. DATE 4-13-78
APPROVED
SCALE 1" = 48 MI
PROJECT NO. 197
DRAWING NO. SY-30-1A-E
REV. 1



Northern Tier Pipeline Co.

IDAHO ROUTE ALTERNATIVES
COEUR 'D ALENE RIVER AREA

Prepared By Butler Associates, Inc.
Consulting Engineers-Managers
Tulsa, Oklahoma

DRAWN	DATE	CHKD.	APP'D.	SCALE		REV.
P. H.	6-1-78	C.L.R.	O.W.	1: 62 500	EXHIBIT I	0

8/7/78

LEGEND

- SPOKANE-RATHDRUM AQUIFER
- PROPOSED PIPELINE ROUTE (ROUTE I)
- ALTERNATE PIPELINE ROUTE (ROUTE II)
- REVISED PIPELINE ROUTE (ROUTE III)

N

SPOKANE-RATHDRUM AQUIFER

PROPOSED PIPELINE ROUTE

ROUTE I

ROUTE II

ROUTE III

SPOKANE

WASHINGTON

IDAHO

IDAHO

MONTANA

COEUR D'ALENE INDIAN RESERVATION

HEYBURN STATE PARK

PENDOREILLE RIVER

SELKIRK MOUNTAINS

COEUR D'ALENE MOUNTAINS

BITTERROOT MOUNTAINS

CABINET MOUNTAINS

CLEARWATER MOUNTAINS

KANIKSU NATIONAL FOREST

COEUR D'ALENE NATIONAL FOREST

ST JOE NATIONAL FOREST

KOOTENAI NATIONAL FOREST

LOLO NATIONAL FOREST

5 0 5 10 MILES

Northern Tier Pipeline Co.

PROPOSED PIPELINE ROUTE
AND
EASTERN IDAHO ALTERNATIVE ROUTES

Prepared By Butler Associates, Inc.
Consulting Engineers Managers
Tulsa, Oklahoma

DRAWN	DATE	CHKD.	APPD.	SCALE		REV.
S.M.	5-15-78	C.L.R.	D.W.	1:250,000	EXHIBIT I A	0

ERT

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.
696 VIRGINIA ROAD, CONCORD, MASSACHUSETTS 01742 CABLE-ERTCON

CONCORD, MA (617) 369-8910
PITTSBURGH (412) 261-2910
ATLANTA (404) 955-3121
HOUSTON (713) 977-6611
FORT COLLINS, CO (303) 493-8878
CHICAGO (312) 620-5900
LOS ANGELES (213) 889-5313
BILLINGS, MT (406) 252-2184